Western Aircraft Maintenance Engineers Association (WAMEA)



Spring 2022 Symposium April 27









Origin and Purpose of the AME License

Disclaimer

What follows is detailed technical information supported by a decade of investigation into the origin of the AME in Canada.

The topics covered in this presentation are supported by factual information vetted by a peer group that includes senior AMEs.

This report covers a 100+ year timeline of events on AMEs beginning in the 1700's with "Regulation and Licensing" being investigated as far back as WW1 supported by legislative documentation, including official reports published by the Parliament of Canada and other nations.

While not everyone will agree with what is being presented, the contents are factual and should be understood as "an area of AME history that needs to be brought into the light as a part of Canadian Aviation" that is unrecognised and which is un-taught.

Every Licensed Profession in the world has documented history tracing back into the mists of time - the AMEs are no different, but we were never given access to the facts supporting our License.

This needs to change.....

What you are told - repeatedly

Professional Engineers are Engineers Air Engineers are just Mechanics

Spreading and Repeating Misinformation Doesn't Make It True, But Does Make It More Likely To Be Believed

Air Engineers are Mechanics

Air Engineers are Pretend Engineers

The "illusory truth effect" (also known as the illusion of truth effect, validity effect, truth effect, or the reiteration effect) is the tendency to believe false / incorrect information to be correct after repeated exposure"

AMEs are Mechanics

AMEs are Mechanics with a glorified name

If repeated enough times, the false information may be perceived to be true especially when the sources are perceived to be credible

AMEs are A&P's

AME means Air Mechanic Engineer

"Repeated statements of the wrong or incorrect information are perceived to be more truthful than truthful, correct or accurate statements."

Air Engineers are Airworthiness Inspection Representatives

Air Engineers = Aircraft Maintenance Engineers

AMEs: What are we?

Mechanics?

Supervisors / Inspectors / Certifiers ?

Both?

Do you believe what you are told?

Do you trust those that tell you without question?

Or do you try and determine if what you are told is actually true?

The truth might shock you - but first we need to learn what we were not taught.

AMT and AME Education: The same thing or?

Presenting the concepts and structure is important, but the AME's understanding of the material related to the license is critical

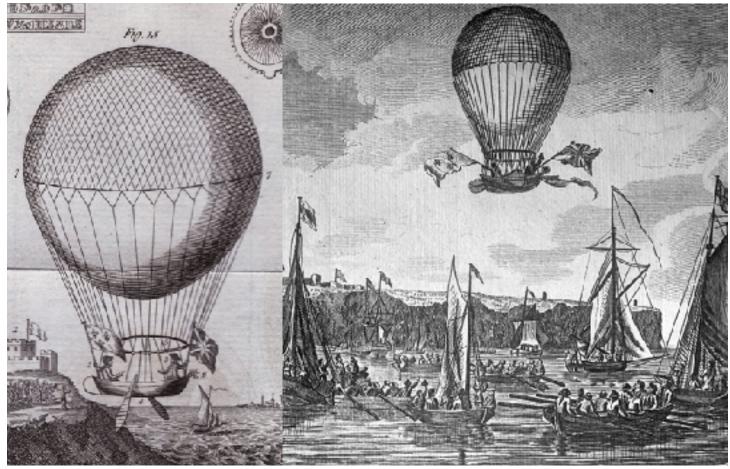
Despite doing well in class, [...] and receiving good grades, the transition from classroom to industry was not seamless. Once employed [...] the competency demands were much different". - Carlos Smith, Asst. Prof, Aerospace Dept. Middle Tennessee State University - "ARE WE TRAINING FOR TESTING OR TRAINING FOR INDUSTRY" ATEC Journal, Vol 41 Iss 1 - 2019

Outdated training mandates (for trades-persons) are more than an impediment; they hinder the aviation maintenance industry's economic growth" Crystal Maguire, Executive Director - Aviation Technician Education Council (USA) 2017 "Aviation struggles with 50-year-old maintenance training regulation". http://thehill.com/blogs/pundits-blog/transportation/345631-aviation-struggles-with-50-year-old-maintenance-training

Many nations have a 2-tier system of training for persons involved in Aviation Maintenance and Inspection/Certification.

Canada was no different - until it wasn't

Commercial Travel thru the Aether - the Potential



January 1785, Jean-Pierre Blanchard and Dr. John Jeffries became the first people to fly across the narrowest point of the English Channel - 21 miles - from Dover, England to Calais, France in a hydrogen filled, taffeta balloon. Their flight took 2hrs 47 minutes. Blanchard had no formal education but he was very inventive. Jeffries was a physician, scientist, and a military surgeon with the British Army in Nova Scotia and New York during the American Revolution. Jeffries graduated from Harvard College in Cambridge, MA and had received his medical degree from the University of Aberdeen, Scotland

The Father of Aeronautics 1799

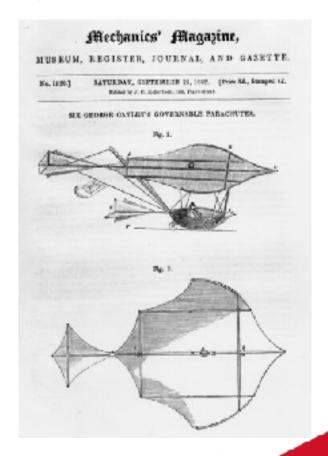


British Inventor and Engineer - Sir George Cayley, 6th Baronet of Brompton and a Member of the English Parliament identifies crucial aspects of aircraft design and stability in 1799 and in 1853 constructs a "Glider"

"Please, Sir, I wish to give notice. I was hired to drive, not fly" - statement by Mr. John Appleby 79, coachman to Haley and the 1st human in the United Kingdom to fly a "Heavier than Air Machine" after "landing" at the end of a flight across Brompton Dale in a "Glider" designed by Cayley.

Caley's glider design was published in "Mechanics' Magazine in September 1853





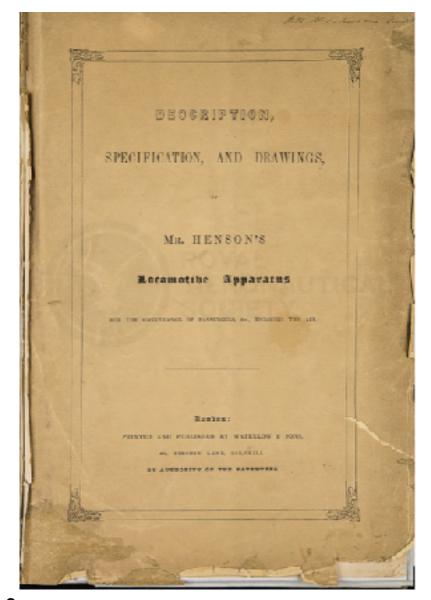
150th Anniversary of Caley's flight

On July 5th 2003 Sir Richard Branson flew a replica of the "Cayley Flyer" before a crowd of 1500 in the same place where the original glider was flown.

"THIS is how flights should be. Over quickly, no cardboard meals and no jet lag"



Aerial Navigation - 1843



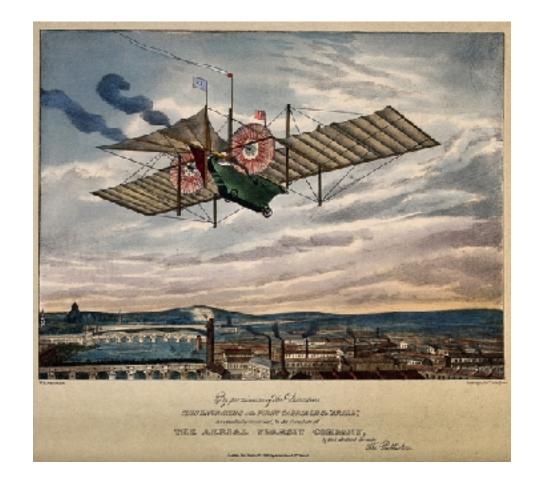
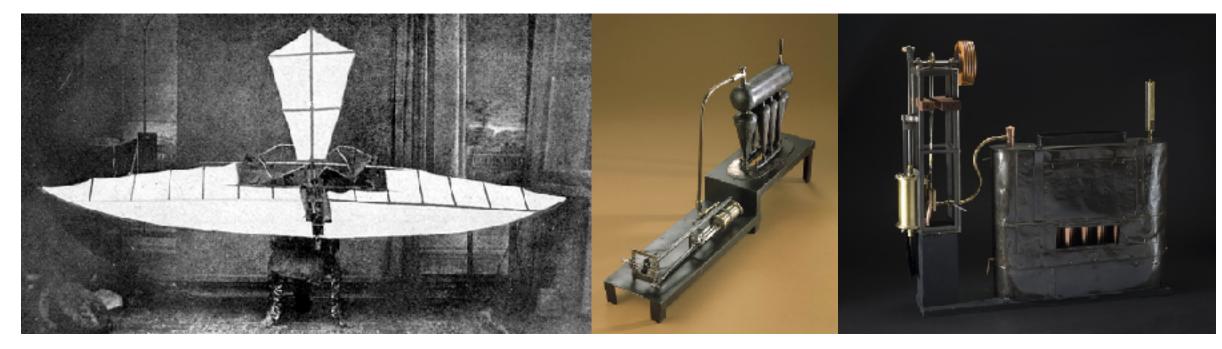


Illustration made and published in 1843 made using information taken from the **description**, **specification and drawings** of Henson's "locomotive apparatus for the conveyancing of passengers & etc through the air"

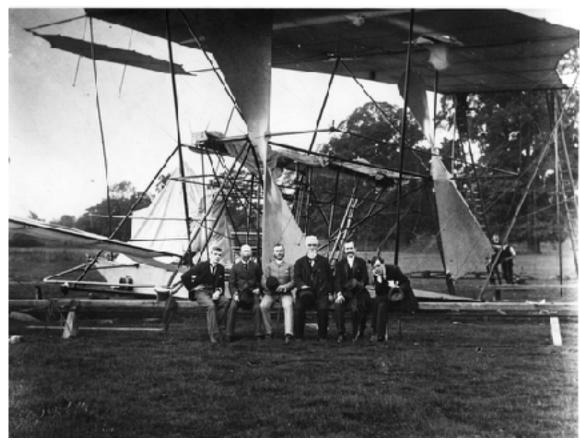
1840's: Henderson and Stringfellow

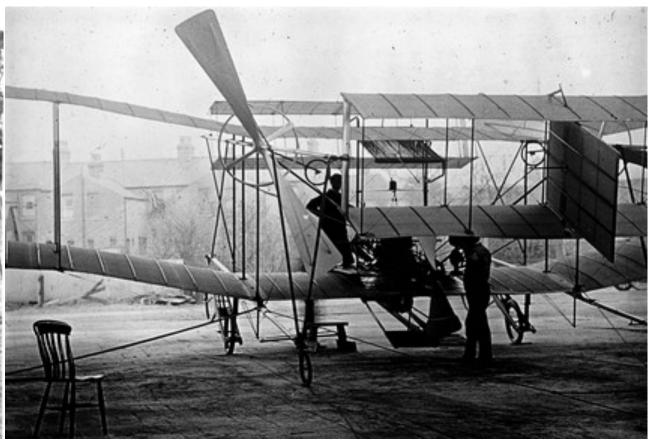


John Stringfellow was contracted by William Henson to build a working model of Hensons's Aerial Carriage - including a small version of its' engine - for public display in London's Crystal Palace at the 1868 exposition. Stringfellow designed ad built the "External Combustion Engine" that powered a large triplane model along a cable in the exposition hall. The Aeronautical Society of Great Britain awarded a prize of £100 to Stringfellow's engine as the lightest in proportion to its power, producing 0.75 kW (one horsepower) for the weight of 5.9 kg (13 pounds).

In 1889 the secretary of the Smithsonian Institute - Samuel P. Langley - purchased Stringfellow's model engine, along with the model aircraft it powered for £25. Langley held on to the engine briefly, sending it to L.D. Copeland of Smithville, N.J., for experimental work. Upon return of the engine to Langley, he turned it over to the museum section of the Smithsonian for public display, also in 1889

1890's Hiram Maxim's Aerial adventures

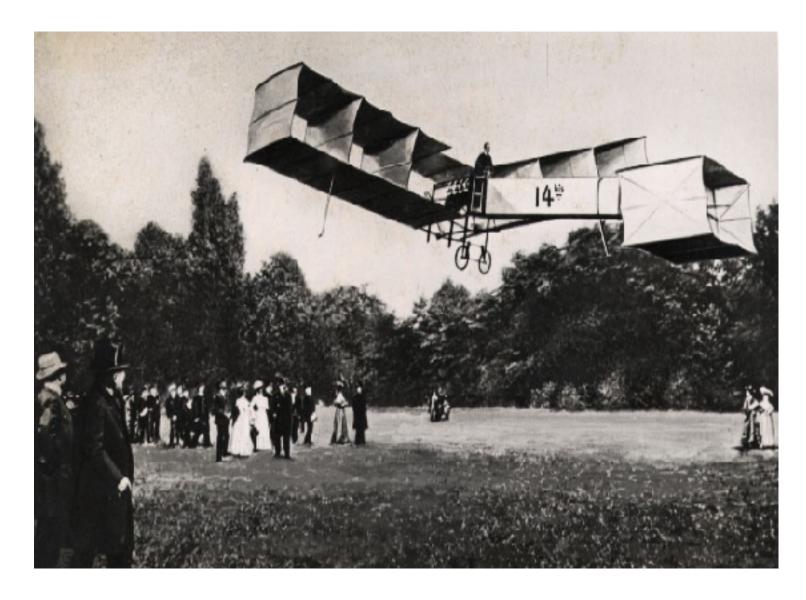




Maxim's 1894 "flying machine" - 131' long x 100' wide, powered by two 150 hp steam engines weighed in at over 4 tonnes. It flew for nearly 500 feet but wasn't controllable and crashed.

Maxim's 1910 "flying machine" -a smaller "refined" version of his 1894 design. A multi-bay wing-warping biplane design that used a petrol engine powering three pusher propellers with a wheel type landing gear - it was never flown

Daredevils & Thrill Seekers 1903 - 1910



The antics and fatalities of the "Aeronauts and Aviators" between 1903 and 1914 result in a near endless stream of reports of "Deaths of Aviators" in newspapers around the world - Aviation is a dangerous sport.

Charles Rolls (Rolls - Royce)



2 June 1910, aviation pioneer Charles Stewart Rolls (Rolls-Royce) world's first non-stop double crossing of the English Channel by aeroplane in *a Wright Flyer license built in England*.

Rolls becomes an overnight celebrity. The soon to be crowned Prince of Wales (King George V.) sent a personal telegram – "The Queen and I heartily congratulate you on your splendid Cross-Channel flight"

Roughly a month later on 12 July the aircraft plunges to the ground in front of crowded grandstand from a height of 100 feet due to structural failure caused by a deviation from the "Wright's design by its owner". Rolls' skull is split like a melon and is pronounced dead at the scene.

The Rolls-Royce emblem was originally 2 red R"s. It was made all black with the passing of Mr. Royce

Selfridge (of Bell's AEA) is killed



September 17, 1908 - Fort Myer, Va Wreckage of the Wright's flyer - pilot Orville Wright (injured) and passenger - Lieutenant Thomas E. Selfridge (killed).

A few days after the fatal crash, Orville woke up in hospital bed and asks to see Charles Taylor "I'd like to have his view on just what happened to cause our spill"

Home Secretary - Winston Churchill



In early 1910 the position of 'Home Secretary' is assigned to 36 year old Winston Churchill.



Churchill greets onlookers after a flight from Upavon to Portsmouth in 1915

The Royal Army's "Balloon School" and Factory



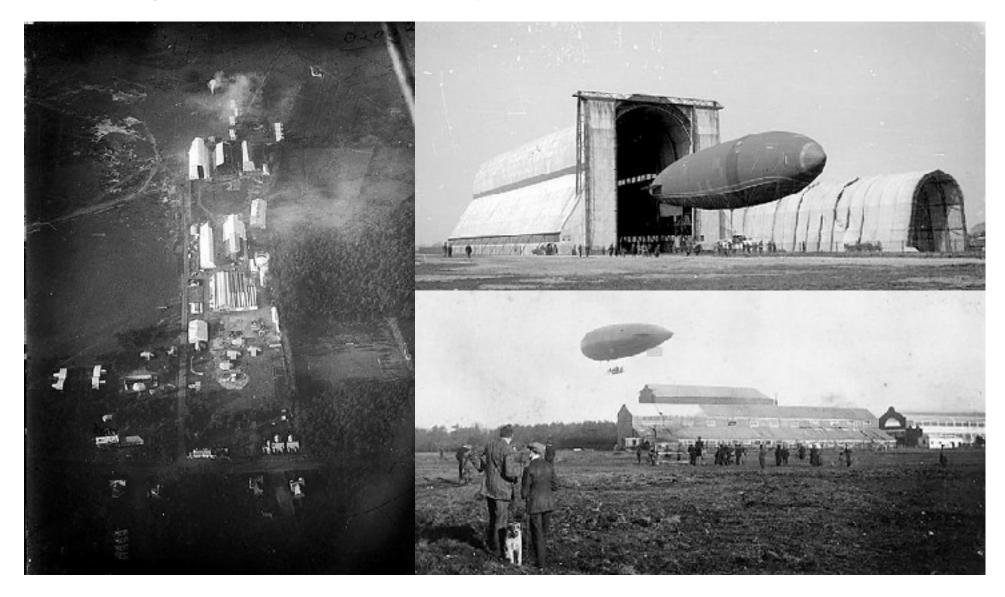
During the U.S Civil War the British Army Corps of Engineers witnessed the use of Hydrogen and hot air balloons by the combatants in order to reconnoiter and to spot the artillery for accuracy. Returning home their observations would result in the creation of a "Balloon School" and factory for the Royal Army



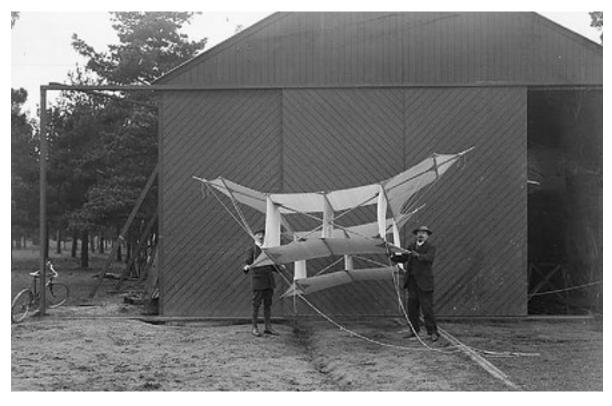
1905 - the Royal Engineers Balloon School moves from Aldershot to the Swan Plateau (Farnborough) bringing a single balloon shed (Hangar), some workshops and a hydrogen generation station.

Balloons were used mainly for reconnaissance and could only be used when there was little or no wind.

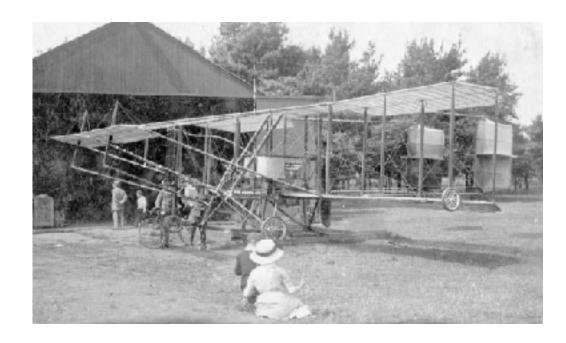
1908 - Farnborough and the Balloon Factory



1908 - Farnborough, Box-lites and experimentation



The Royal Engineers 'box-kite' flying activities at Farnborough were led by Samuel Franklin Cody, an American. "Man-carrying kites" (Including box-kites) were developed for use in windy conditions and to be towed behind ships or motorised carriages Cody's 'box-kites' were soon developed into "heavier than air" machines by adding an engine. Shown here is a "Small" kite.



On October 16, 1908 Cody makes the first official flight of a heavier than air machine 'in Great Britain', covering a distance of 1,390ft in British Army Aeroplane No. 1 (shown above)

Although 1st to fly in 1903, the Wrights virtually disappear until the Paris Air display of 1908

1908 - Farnborough: "Powered Kites" the Aircraft Factory

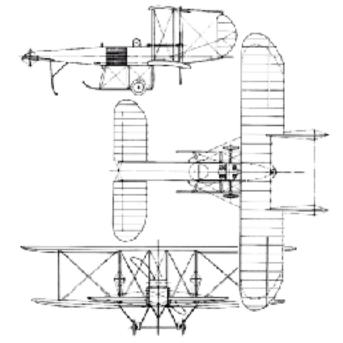
The Royal Aircraft Establishment was formed in 1918 after the Royal Aircraft Factory (RAF) and newly formed Royal Air Force (RAF) ended up with the same initials.

To avoid confusion the name 'Royal aircraft factory' (R.a.f.) was renamed the 'Royal aircraft establishment' (R.A.E.) after WW1. In 1988 the name was changed again to 'Royal Aerospace Establishment' creating the organisation that lasted until 1991.

A us Scientific Advisor was infuriated that "Technical Aeronautical research" would be placed under the control of a "Factory Manager" and advised the President to "Not do what the British have done" - i.e put everything aviation under one roof.



1911 R.a.f Santos Experimental #1 "S.E.1"
18 August 1911 the aircraft was flown Lt.
Theodore J. Ridge, Assistant Superintendent of the factory who had only been awarded his Pilot's certificate the day before - he stalled / spun in and was killed.

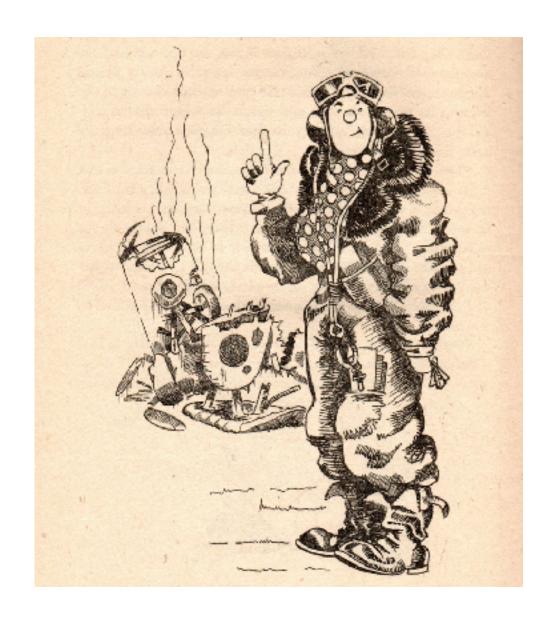




S.F Cody "Cody Mark V" with a passenger

Pruneism

the term "Pranged my Kite / pranged your Kite" that was used by the pilots of the RFC/RAF and other of the British Air Forces during WW1 and later WW2 - when they crashed and walked away - is a direct reflection of the evolution of their machines from the powered Box-Kites developed by the Royal Engineer's at the Royal Aircraft Factory.



Meanwhile in Canada





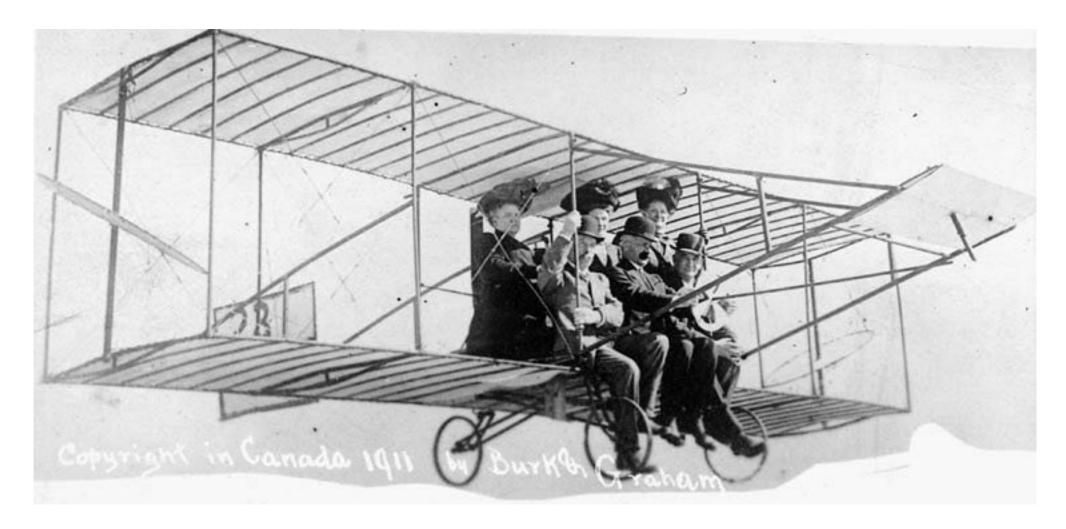


Lohner aeroplane #1 test flight - Ottawa 14 March 1910

Ward aeroplane - 05 October 1911

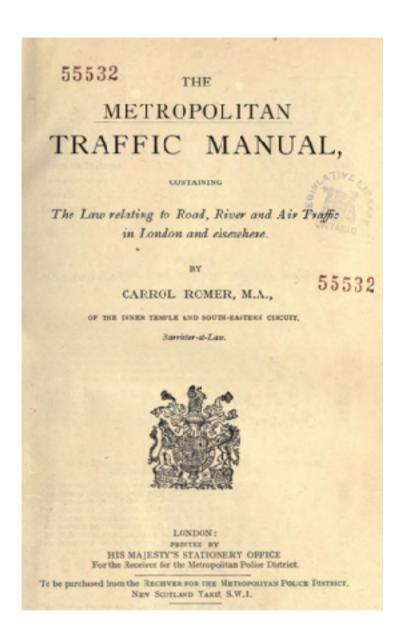
Constable aeroplane #2 - 02 October 1911

Getting your photo taken in a Flying machine



22 June 1911 - More than a King's Coronation

Aerial Navigation. To provide for the protection of the public against dangers arising from the Navigation of Aircraft. Presented by Mr. Secretary Charchill. supported by Mr. Masterman. Ordered, by The House of Commons, to be Privated. 25 Way 1911. LONDING PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE. To be purchased, a theodirectly as to occurring Bouleviller, from WYMAN and Sons, Ltm., Fetter Lave, P.D., and 29, Abburden Street, S.W., co. Curvey and Box of Two aldels Court, No observing or K. Powerson, Lap., 186, Senten Street, Debrin. Printed by Even and Secretawoons, Letter East HANDIDG STREET, E.C., TRINCRES TO THE THYO'S NEW PROTECTION NAMED IN Price de. Bill 230.]

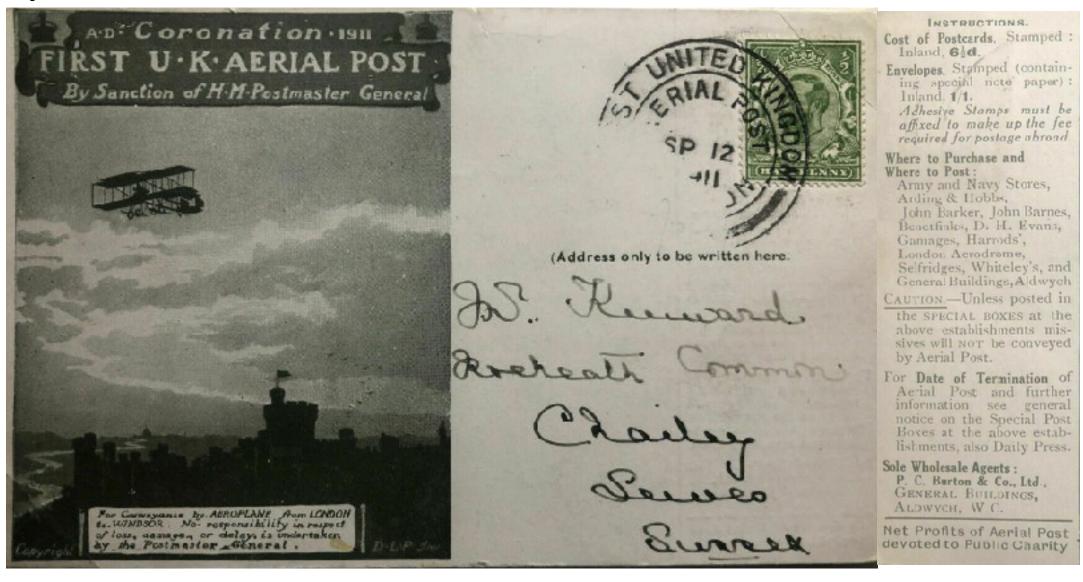


1911 - Air Law evolves - Royal Coronation





Royal Aerial Mail - 1911



1911 - 1st record of a "Canadian Business License" related to Aviation



1st notice of "Letters Patent" being issued to a business for conducting business in Canada related to "Aerial Navigation" is recorded in the Canada Gazette volume 44 issue # 45 as required by the Companies Act, 1906 (Pt. 1 Ch. 70 R.S.C 1906)

Control of Material and War supplies - Aviation

The British Aeronautical Inspection Directorate (AID) fell under the offices of the Ministry of Supply and Ministry of Aviation was the quality control and airworthiness branch which inspected / tested all British airframes and engines, airframe and engine components, navigation equipment and accomplished flight-testing.

The need for an aircraft inspection department was officially recognised by the British Government - particularly the Board of Trade and the War Office - in 1912, when the report of the Departmental Committee on Accidents to Monoplanes was published.

The Aeronautical Inspection Department (A.I.D.) of the British War Office was formed in December 1913 for the purpose of "inspecting aircraft and other supplies" for the Royal Flying Corps (RFC). The A.I.D. is immediately organised into two main technical branches dealing with:

- A. the inspection of aeroplanes (during and after assembly), and
- B. the inspection of engines (during and after assembly)

Additional branches are created to deal with the inspection of:

- 1. Parts of Aeroplanes, and
- 2. Parts of Engines
- 3. Materials used to make the parts

Each Branch was under the control of an "A.I.D. Inspector."

The AID headquarters (1913) were temporarily established in a private house at Farnborough and divided into sections, each containing officers specialising in its particular branch of engineering or (material) science.

By the end of the War "RAF Farnborough" was the "Research" facility and the main A.I.D. was placed within the "Air Ministry"

Aviation Changes Forever

GREAT BRITAIN DECLARES WAR ON GERMANY.

The Daily Midrolly Angula 5, 1914

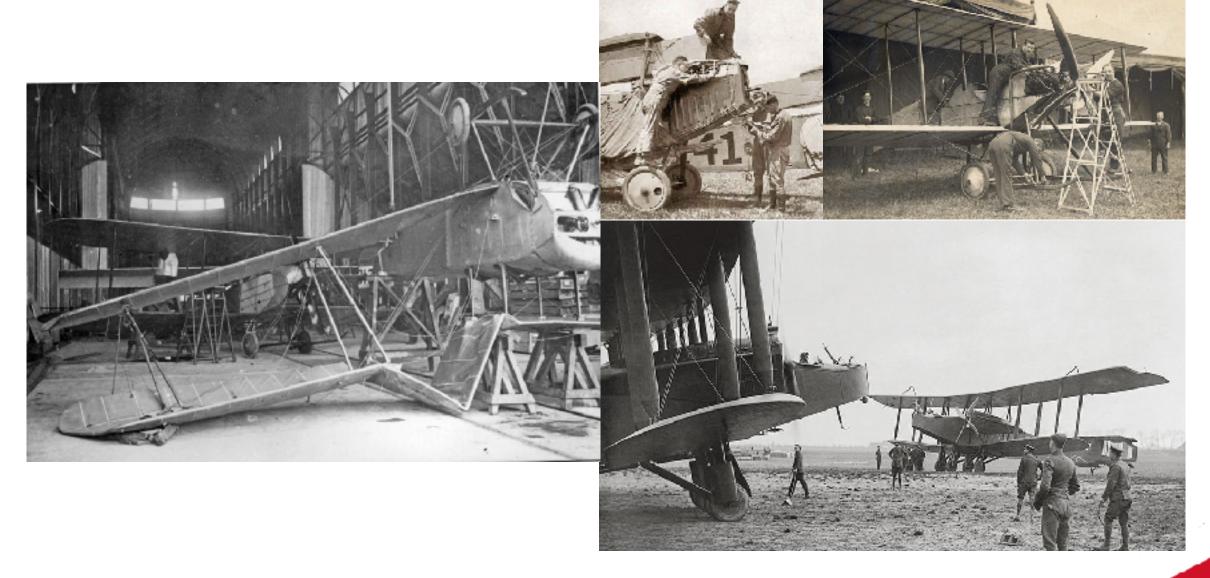
GREAT BRITAIN DECLARES WAR ON GERMANY.

More Daily Midrolly Angula 5, 1914

One Halfpenny.

DECLARATION OF WAR BY GREAT BRITAIN AFTER UNSATIS-FACTORY REPLY TO YESTERDAY'S ULTIMATUM.

WW1 Aircraft Inspection -



1917 - Civil Aerial Transport Committee

In May 1917 the British Imperial Parliament establishes a "Civil Aerial Transport Committee"—under the chairmanship of newspaper magnate and aviation advocate Lord Alfred Northcliffe—to analyze postwar commercial aviation in the domestic, imperial, and international contexts. Believing an international agreement to be "of urgent importance for the purpose of encouraging civil aerial transport," the committee produced a draft air convention and an imperial air-navigation bill.

In Canada, the requirement for creation of a "Canadian an Air Board" along the lines of the British Air Board is submitted in January 1918. It is passed and issued as Privy Council Order (P.C.) 1919-0211

P.C. 1919-0186 is submitted by the Vice Chairman of the Reconstruction Committee for the constitution of a "National Aeronautical Advisory Committee" on 14 January 1919

In Canada the "Civil Aerial Transport Committee Report on Civil Aerial Navigation" is received from British Secretary of State for Colonies - and introduced to the Canadian Government by acting Secretary of State for External Affairs and recognised as P.C. 1919-0230.

in the USA there are no US Federal aeronautical regulations created until 1926, and no Federal regulations related to "Inspection of Commercial Aircraft for Airworthiness" until 1939/40

A. L. Sifton, S. C. Mewburn and C. C. Ballantyne and O. M. Biggar, R. M. Coulter, J. A. Wilson and E. S. Busby are appointed to the Air Board by P.C. 1919-1295

1919 - Civil Aviation Regulation - Canada

Robert Borden's Canadian government "assumes jurisdiction" of aviation in Canada including safety regulation with the passage of the Air Board Act of 1919.

The Air Board confronts the challenges of "recruitment" of personnel, "aircraft maintenance" and "questions concerning the proper administrative structure for civil and military aviation".

Canadian Privy Council order 1379, passed July 7, 1919 forbids low-level flying over urban areas, "trick...or exhibition flying" over cities or public gatherings, and the intentional or unintentional dropping of articles from aircraft.

P.C 1379 provides bare minimum safety requirements in Canada.

Meanwhile in the USA there are no US "Federal aeronautical regulations" created until 1926/27 when the United States Department of Commerce creates a Bureau of Aeronautics and finally implements "National" aircraft registration and licensing requirements for pilots and mechanics.

The U.S adopts the "British" system - with a few changes. One change is that the U.S places inspection and certification in the hands of Dept. of Commerce employees.

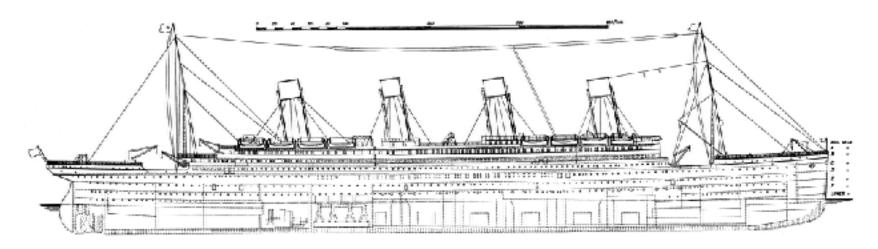
Another is that it calls its maintainers "A & E Mechanics" - because "for some reason the British used the letter "C" to designate an engine mechanics".



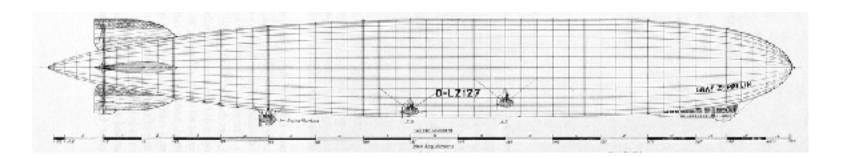
Merchant Marine Service - Merchant Air Service: Similar Issues for Safety



Titanic vs. Zeppelin



Titanic's carrying capacity was 46,328 tons and she could move thru the water at sa cruising speed of 21kn / 24 mph Crossing the Atlantic in roughly 137 hrs / 5-6 days



The Graf Zeppelin could carry 33,000 lbs over a distance of 5,400 nm at 80+ mph - Crossing the Atlantic in roughly 112 hrs / 4.6 days

Both vessels were subject to weather restrictions, but unlike a steamship, a Dirigible was not burdened by Ice or floating debris.

1919: Canadian Air Board -

Numerous citations of the "International Convention" within the "Air Regulations, 1920" point to a complementary clauses within "The International Convention of Aerial Navigation" which was part of the Paris Peace Treaty of 1919.

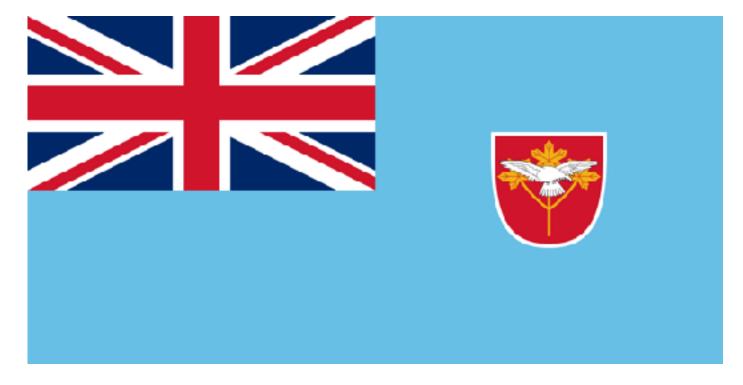
The abbreviation "I.C" for International Convention follows nearly every provision.

The Air Board took great pains to ensure regulatory compatibility with "the convention".

There was only one small issue - the Air Engineers'

Although identified as "NEW" in the Air Regulations, 1920 there is no related "I.C" to which the term refers - and when the treaties and agreements between Canada and the USA are reviewed it appears that although 'Cross Border Flying and Commerce" were placed under Canadian Air Board Control - the "Conditions of Airworthiness" for aircraft flying into the United States was done using an "agreement with the

British Empire".

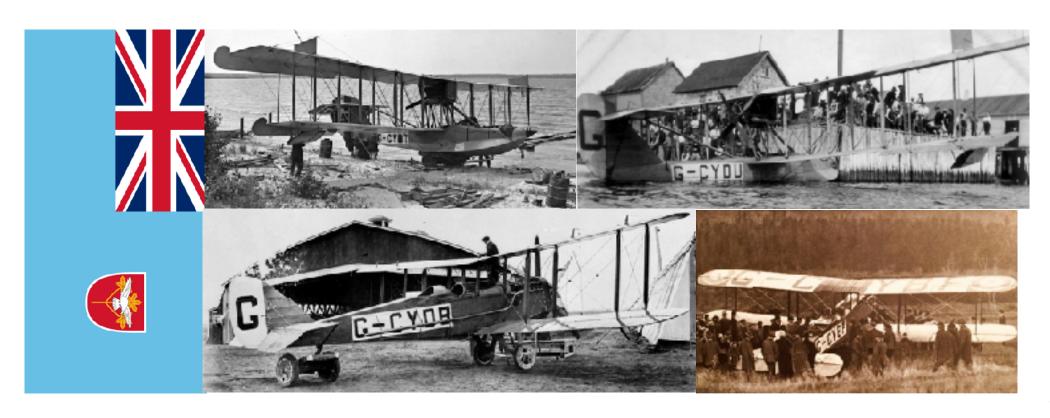


Canadian Air Board & Private Operators of "British Registered" aircraft 1920

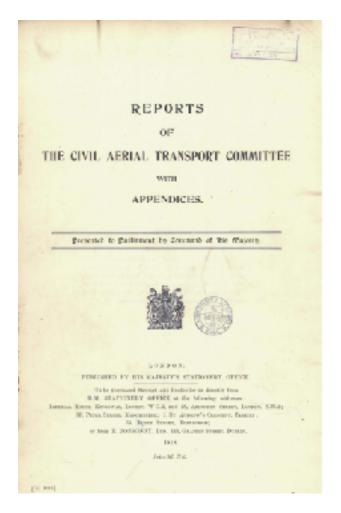
In 1919 the United States Navy presented the Government of Canada with 12 HS-2L flying boats from the U.S Navy's WW1 costal patrol stations in Nova Scotia.

Between July and September 1920, the British government gifted over one hundred war surplus aircraft to Canada.

24 flying boats of assorted types, 23 assorted DeHavilland types, 62 Avro 504 trainers, 2 Bristol Fighters, 12 SE5a Fighters, and 2 Sopwith Snipes, 12 Airships and 6 Observation Balloons. All of these aircraft are "Registered" in the "British Empire" with identification prefixed with a "G". From 1920 onwards these "G" registered aircraft are operated in Canada by Canadian Pilots, but signed of every day and after maintenance by persons who hold a "British Aeronautical Ground Engineer's License". The Canadian Air Board calls them Air Engineers.



Imperial Committee on Civil Aviation 1917





The Committee was appointed on May 22nd, 1917, to consider and report to the Air Board* with regard to:—

- 1. The steps which should be taken to the develop and regulate Aviation after the War of aviation for civil and commercial purposes from a domestic (England), imperial (British Empire), and an international (rest of world) standpoint.
- 2. The extent to which "the trained personnel and the aircraft which the conclusion of Peace may leave surplus to the requirements of the Naval and Military Air Services of the United Kingdom and Overseas Dominions" could be utilised for Civil and commercial purposes

NOTE: When the Reports of the Committee were presented to Parliament, the Air Board had been replaced by the Air Council.

Canada was officially represented on the 1917 Committee by "The Honourable Sir G.H. Perley" however at all Special Committees and, when necessary at meetings he was himself represented by Lieutenant Colonel E.R. Weyland

"I fully concur in the recommendations contained in the Report regarded solely from the point of view of the development of civil aerial transport" - John Baird, Chairman

Trenchard and the "Brats" / RFC Camp Borden the A.I.D and Stedman

The British AID accomplished the inspection of aircraft and engines built in Canada during WW1.

At Camp Borden a DND Aircraft Inspection Department which would undertake the inspection of aircraft parts during or after manufacture was established in 1922

It was required that personnel in this department did not come under the control of the shops engaged in the production.

The Air Board felt that independent inspection was necessary. This was the first postwar provision for an AID in Canada.

The DND Borden AID was required to make periodical inspections of civil aircraft for renewing certificates of airworthiness.

Stedman relates that "after some time it was found that sufficient experienced inspectors were available "outside" - he refers to people of the "Outside Service".

NOTE: the "Inside Service" = Ottawa, Outside Service = Everywhere else in Canada

The Air Board later "adopted the British system of approving inspectors employed by the various companies"



37

RFC Camp Borden

1917 - Camp Borden is the first flying station to be built in Canada by the Royal Flying Corps (FRC).

01 April 1918 The RFC becomes the Royal Air Force (RAF). Borden is renamed"RAF Flying Station (RFS) Canada" 01 April 1924 RAF Flying Station (RFS) Canada is handed over to the New RCAF and becomes "RCAF Station Borden" From 1920 until WW2 Military and Civilian Technical and flying training is delivered at RCAF Station Borden. Although officially a "Military Facility" the Canadian Air Board and the heads of the Canadian Air Services in Ottawa view Camp Borden as "The singular training centre for ALL aviation trades-persons in Canada".

This will prove to have severe consequences for the training and certification of Canadian Trades persons involved in Aviation.

<u>In 1970</u> with the joining together of CFATS and the Royal Canadian Electrical and Mechanical Engineers School, Borden becomes the "Canadian Forces School of Aerospace and Ordnance Engineering" (CFSAOE). In 1984, an agreement between Canadian Forces Training Systems and Air Command lead to the formation of the present Canadian Forces School of Aerospace Technology and Engineering (CFSATE), where <u>AERE</u> Officers and <u>MOC</u> 500 series technicians (13 trade groups) receive their basic and some advanced training.

In January 1997, the Military Occupation Code (MOC) 500 series trades undergo a major restructuring which redefines the roles of numerous trade's occupations. The previous **thirteen <u>MOC</u> 500 trades** were amalgamated into 3 on-Aircraft occupations and one off-Aircraft occupation. On-Aircraft occupations:

- 1. Aviation Systems Technician (Avn) MOSID # 00135,
- 2. Avionics Systems Technician (Avs) MOSID # 00136 , and
- 3. Aircraft structures (ACS)

Off-Aircraft occupation: Photo.

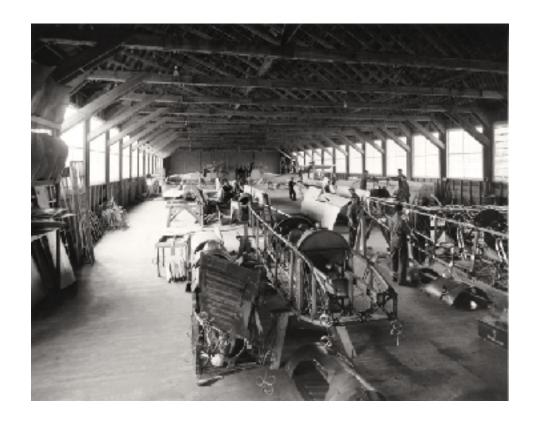
This amalgamation leads to major changes in the school's method of training.

There are 2 additional:

Flight Engineer MOSID # 00021

Aviation Maintenance Superintendant MOSID # 00363

RFC Camp Borden



Aircraft repair at Camp Borden 1917.

LIBRARY AND ARCHIVES CANADA # PA22857

the aerodrome portion of Borden - empty since January of 1919 - and airfields had been sold by the British Government's "Imperial Munitions Board" to the Government of Canada.

"Imperial Gift" of over one hundred surplus land aircraft, seaplanes, kite balloons and airships found its way to Camp Borden in 1920.

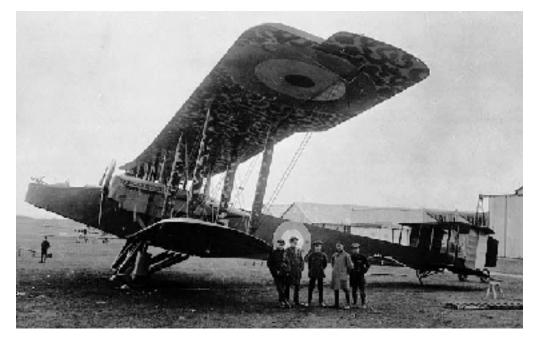
Canadian Air Force - proposed organization - Chairman Air Board (M. Sifton) 1919-11-29 - Order in Council number: 1919-2431 Date introduced: 1919-12-01

Once the Canadian Air Board was formed in 1919 there were many RAF retirees clamouring to form a "Canadian Air Force (CAF) quickly turned to Camp Borden and its training facilities looking to use it for their own purposes. and on 05 July 1920 Camp Borden was taken over by the Canadian Air Force (CAF), a newly formed non-permanent, non-professional force under the control of the Air Board.

Camp Borden becomes the first flying station of the CAF, its School of Aviation. Shortly after,

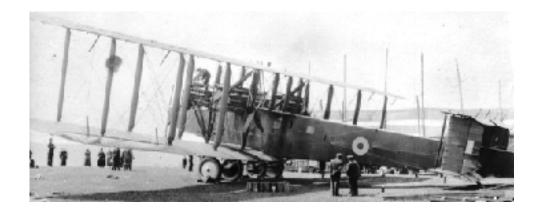
No. 1 Wing CAF Camp Borden comprises: a School of Special Flying, one Squadron with two flights, and a ground instructional section.

Stedman, Alcock & and Brown

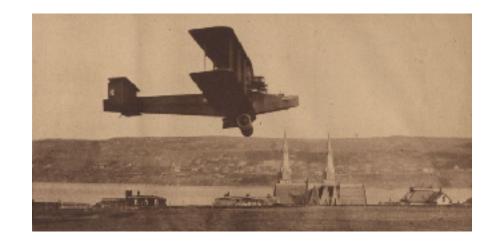


1917 - Handley Page H.P-11 O/100 S/n 1459 "Le Tigre" of No. 3 Wing RNAS in Ochey, France. Stedman is 2nd from the left. This type was flown by "Canadians" serving in the RFC.

10 May 1919 - Stedman arrives in Harbour Grace, Newfoundland as the "Engineer-in-Charge" (E.I.C) of the crated Handley-Page V/1500 that was shipped from England to be assembled to compete for the \$10,000 non-stop Trans-Atlantic flight prize.



10 June 1919 - Harbour Grace, Newfoundland - assembled Handley Page V-1500, in preparation for the Atlantic crossing.



Handley Page V-1500 during test flight

From Long Range Bomber to Civilian Transport

Although designed for war, the Handley Page V/400 and V/1500 could be outfitted to carry up to 25 people and had extremely good long range capabilities. To the ex-RAF officers coming to Canada after WW1 - many of whom had experience on this aircraft type, the possibilities for putting decommissioned/war-surplus surplus machines to "Commercial Use" would have been seen as "lucrative". However, the majority of the "returnees" and emigrants returning from the battlefields of Europe who flew the machines would not have "The full awareness" of what it took to

design, build and maintain them



British Air Navigation Act, 1918

Foreseeing and end to hostilities in Europe, the UK Parliament decided that the UK Government should take responsibility for the airworthiness of civil aircraft registered in the United Kingdom well before the "Paris Peace Talks" and the creation of the "International Convention on the Regulation of Aerial Navigation" (I.C.A.N. - 13 October 1919)

When the UK's Air Navigation Act, 1918 was passed the Country was still at war and even under the terms of the Armistice - would remain under "War Conditions" until Parliament could officially resume in 1920. As such the Air Navigation Act, 1918 although passed - could not become official "Civilian Law" until the war officially ended

"The person responsible for seeing that the wishes of Parliament are carried out is the Secretary of State for Air, and the law requires that he shall be satisfied that the design and construction of all British registered civil aircraft holding a British Certificate of Airworthiness or a British validation of a foreign certificate are sound, and after they have been put into service they shall be maintained in an airworthy condition.

It is obvious, that although this is a general statement of the position, it must be interpreted in accordance with practical possibilities.

"The Secretary of State himself cannot be expected to examine aircraft, and therefore, he must either employ assistants to do it for him, or must delegate his duties to suitable persons, and he cannot, even with the assistance of these, be responsible for the airworthiness of all aircraft all the time."

The "Person Delegated this duty" and Licensed to be responsible for attesting to the airworthiness of Aircraft on behalf of the Secretary of State' is officially titled a "Licensed Aeronautical Ground Engineer" but generally called an "Aeronautical Engineer", or "Ground Engineer" or "L.A.E."

"The licence authorises the holder to inspect and certify, it is not, and should not be regarded as

"a certificate of competence to do any work required to render the aircraft or engines fit for certification"

British Air Ministry - Aeronautical (Ground) Engineers' Licenses

Aeronautical (Ground) Engineers licensed by the British Air Ministry to Inspect and Certify Aircraft as Airworthy differ from "Aeronautical Designers" in that Aeronautical Designers are NOT licensed by the Air Ministry.

Aeronautical Designers are however required to do their work to the standards and specifications established by the Air Ministry and sign affidavits attesting to this.

The functions of a licensed (Aeronautical Ground) engineer arise from the various official Orders and Directions which are to be found in the following British Government publications:-

- ➡ The Air Navigation Order (A.N.O.) as amended by subsequent Orders and Provisional Orders,
- → Air Navigation Directions (A.N-D.) and subsequent amendments.
- → Air Navigation Regulations (A.N.R.) and subsequent amendments.
- → Airworthiness Handbook for Civil Aircraft (Air Ministry Publication (AP.) # 1203 Vol. I Design, Vol. 2 Inspection.
- Notices to Aircraft Owners and Ground Engineers

An applicant for a licence was required to prove that they were well versed in these Orders, Directions, Regulations, Publications, Notices etc.

Post-War development of Civil Aviation

On 1st January 1920 the RAF had 15,802 aircraft on charge, of which 5,582 were considered obsolete. Of the total, 326 were allotted to Colonial governments as an 'Imperial Gift' in order to foster the development of Civil aviation in the Commonwealth nations of:

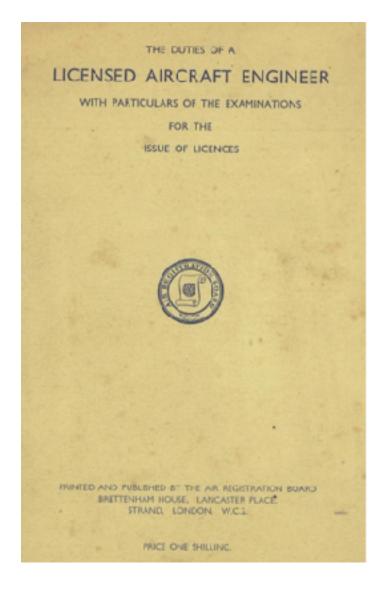
- Australia (issues AME Licenses)
- Canada, (issues AME Licenses)
- → South Africa, (issues AME Licenses)
- → India (issues AME Licenses), and
- → New Zealand (issues AME Licenses).

Surplus British Aircraft were also supplied to

- France,
- → Greece (40 x DH9),
- → Poland (40 x DH9),
- → Chile (40 x DH9),
- → Japan,
- → Latvia,
- → Russia,
- **→** Romania,
- → Norway
- → Belgium,
- ➡ Estonia and
- → the USA.

Along with the aircraft - the British knowledge of how to maintain them and how to inspect and certify them for use in Civilian Aviation was also provided!

British Licensing:-



THE FUNCTIONS of a licensed engineer arise from the various official Orders and Directions which are to be found in the following Government publications:-The Air Navigation (Consolidation) Order 1923 as amended by subsequent Orders and Provisional Orders. Air Navigation Directions 1936 (A.N.D.13) and subsequent amendments. Air Navigation Regulations. Airworthiness Handbook for Civil Aircraft AP.1208 Vol.I Design, Vol.II Inspection. Notices to Aircraft Owners and Ground Engineers. A.R.B. HANDBOOK No. 2

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Legal Structure of British based legislation - Aeronautics

Structure of the British Aviation Law

- 1. Air Navigation Order (ANO) Order from the Crown
- 2. Aeronautics Act (AA) an Act of Parliament
- 3. Air Navigation Regulations (ANR) Air Regulations
- 4. Air Navigation Directions (AND), -
- 5. Air Publications (A.P),# 1208 Vol 1 & 2 Civil Aircraft AirworthinessDesign & Inspection requirements
- 6. Air Advisory Circulars,
- 7. Notices to Pilots / Owners / Engineers,
- 8. etc

Canadian Aviation Law is BASED on British Law - but..... a few things don not wind up in "Civilian" records

- 1. Order in Council / Air Navigation Order (ANO)
- 2. Aeronautics Act (AA) an Act of Parliament
- 3. Air Regulations
- 4. Engineering & Inspection Manual (AP 1208)
- 5. Advisory Circulars,
- 6. Notices to Pilots / Owners / Engineers,
- 7. etc

British Licensing: One AME's License - 1936

AIR MINISTRY

Air Navigation Act, 1920

.This GROUND ENGINEER'S LICENCE No. 3022 dated 28th May, 1936, has been issued to P. A. Permant-Res.

who is hereby licensed as a "competent person" under Schedule II of the Air Navigation Consolidation) Order, 1923, for those purposes only which are specified in the entries made under the particular categories named on pages 3 to 9 of this Licence.

This licence is valid for the period shown on pages II and 12.

Given at London this 28th

day of

May 19 36.

Name? A. Pennant-Rea Licence No.3022

CATEGORY A-

(Imspection of Aircraft before flight.)

Valid only for :-

Landplanes of de Havilland design and construction (excluding compass adjustment and electrical services but including turn indicator).

NameP.A.Fennant-Rea

Licence No. 3022

CATEGORY B-

(Inspection of Aircraft after overbook)

Valid only for :-

D.H.60.G. & M, 80.A., 82.A., 83, 84, 85, 87.B., and 89 landplanes, excluding electrical services.

CATEGORY C-

(Inspection of Aero-engines before flight,)

Valid only for :-

"Gipsy" engines in aircraft (excluding supercharged engines and engines fitted with V.P. airscrews).

These pages are from an "Aeronautical Ground Engineer's License" issued by the British Air Ministry using U.K. Civil Aviation Form # 9

ENDORSEMENTS.

This Licence is hereby validated for use in the Union of South Africa until the 27th May, 1937.

PRETORIA. 28.7.1936.

The license was also endorsed by the CAA of the Union of South Africa in order to certify SA registered aircraft

British Licensing: One AME's License - 1946

Aircraft Engineer (M)

MINISTRY OF CIVIL AVIATION

Air Navigation Acts, 1920 to 1938

This AIRCRAFT

MAINTENANCE ENGINEER'S LICENCE

No. 3022 dated 12th September 1946 has been granted to P.A. Pennant-Res

who is hereby licensed in accordance with the Air Navigation Acts, 1920 to 1938, and the Orders in Council in force thereunder to uct in the capacity of aircraft maintenance engineer for the purpose of performing the duties of certification in connection with the construction, repair and maintenance of aircraft and matters connected therewith for which this licence is ralid as shown on pages 3 to 9 hereof.

This Licence is valid for the period shown on pages 11 and 12.

Given at London this 12th

day of September

Divactor-General of Civil Aviation.

Aircraft Engineer (M)

Name P.A. Pennant- Licence No. 3022

CATEGORY A-

(Applicable to sircraft, excluding engines)

Valid for the undermentioned types of aircraft for such duties of certification as may be prescribed for this Category, in the Air Navigation Regulations for the time being in force:—

All landplanes.



Aircraft Engineer (M)

CATEGORY B-

(Applicable to sireraft, excluding engines)

Valid for the undermentioned types of aircraft for such duties of certification as may be prescribed for this Category, in the Air Navigation Regulations for the time being in force:

All landplanes.

Aircraft Engineer (M)

Name P.A. Pennant- Licence No. 3022

CATEGORY C-

(Applicable to engines)

Valid for the undermentioned types of engines for such duties of certification as may be prescribed for this Category, in the Air Navigation Regulations for the time being in force:—

Allair-cooled aircraft piston engines in aircraft.

Aircraft Engineer (M)

CATEGORY D-

(Applicable to engines)

Valid for the undermentioned types of engines for such duties of certification as may be prescribed for this Category, in the Air Navigation Regulations for the time being in force:—

All unsupercharged aircraft piston engines.

Aircraft Engineer (M)

CATEGORY X-

Valid for :--

Certification of the installation, adjustment and compensation of direct reading compasses in aircraft.

Air Law - Regulations, a Convention and Canadian requirements

1911



April 1919



Oct. 1919



1920

[1 & 2 Geo. 5.]

Aerial Nacigalion.

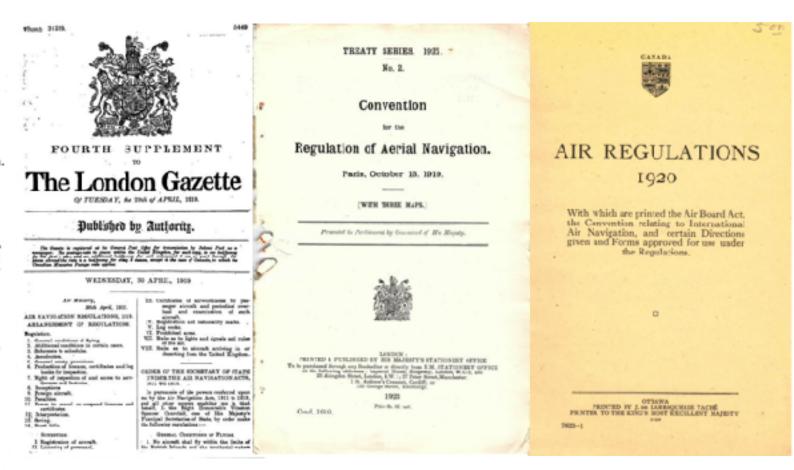
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BILL

300

Provide for the protection of the public against dangers A.B.1911, arising from the Navigation of Aircraft.

- 1. If any person navigates an aircraft recklessly or negli-fronty as gently, or in a manner which is dangerous to the public, he shall already to be guilty of an offence under this Act; and in determining a danger whether an aircraft is navigated in a manner which is dangerous of the to the public, regard shall be had to the amount of damage to public.
 10 person and property likely to be occasioned in the event of a mishap occurring to the aircraft.
- 2.—(1) A Secretary of State may for the purpose of pro-Power is testing the public from danger from time to time by order problid: prohibit the navigation of aircraft over such areas as may be of aircraft prescribed in the order, and if any person navigates an aircraft over process of aircraft over any such area in areas, contravention of any such order, he shall be guilty of an offence under this Act.
- (2) Any such order may apply either generally to all aircraft 20 or in aircraft of such classes and descriptions only as may be specified in the order, and may prohibit the navigation of aircraft over any such prescribed area either at all times or at such times or on such occasions only as may be specified in the order, and either absolutely or subject to such exceptions or conditions as 25 may be so specified.
 - If any person is guilty of an offence under this Act, resulted to be shall be liably on conviction on indictment to imprisonment offence.
 [Bill 280.]



Canada - Control of Civil Aviation

In 1919 the Parliament of the Dominion of Canada passes "The Air Board Act" (1919, c. 11) - Statute Law. The statute established the requirement for an air board and Order-in-Council (P.C.) 1925 of 23 June 1919 allows for the appointment of a board of representatives from the Militia, Naval Service, Post office and Customs to be formed.

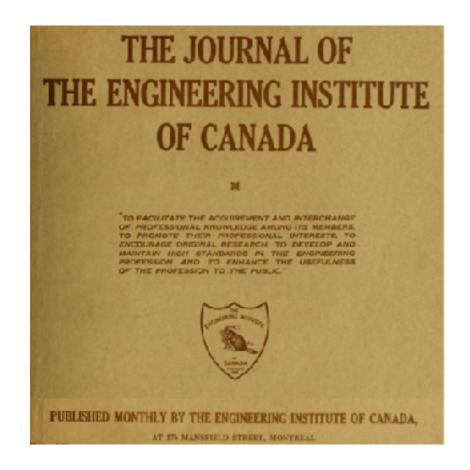
17 January 1920 - Air Regulations approved by the Governor-in-Council are published in the Canada Gazette pursuant to statute law.

At this point ALL Canadian Airmen (not just Pilots) are considered "Reserve Members of the Canadian Militia"

The National Defense Act 1922" (1922, c. 34) transfers "the powers, duties and functions vested in the Air Board or by order or regulation made thereunder," to be "administered, exercised and performed by, or under the direction of, the Minister of National Defense" and the Air Board Act became known as the Aeronautics Act, being "an Act to authorize the control of aeronautics.

John Armistead Wilson - US Educated "P.Eng"

Engineering Institute of Canada: Journals



AIR NAVIGATION REGULATIONS. Convention relating to International Air Navigation. Aeronautics, vol. 17, nos. 302, 303, 304 and 305, July 31, Aug. 7, 14 and 21, 1919, pp. 124-127, 145-147, 170-173 and 197-198, 4 figs. July 31: International Convention for Regulation of Air Navigation agreed by representatives of allied and associated powers serving on International Commission dealing with aerial navigation. Aug. 7: Rules as to lights and signals; rules of the air. Aug. 14: International aeronautical maps and ground markings; collection and dissemination of meteorological information. Aug. 21: Customs regulations applicable to aircraft and goods. (Concluded.)

Regulation of Air Navigation in United Kingdom. Automotive Industries. vol. 41, no. 10, Sept. 4, 1919, pp. 453-456. Illustrating to what extent English Government is aiding arreraft industry to get foothold in civil life.

AIRCRAFT MINISTRY, BRITISH. How Britain Has Originated Its Aircraft Ministry. Allen Sinsheimer. Automotive Industries, vol. 41, no. 9, Aug. 28, 1919, pp. 399-401, 1 fig. British and American organizations contrasted.

LICENSING OF ENGINEERS. The Licensing of Aeronautical Engineers and the Inspection of Aircraft, G. Edward Barnhart. Aviation, vol. 7, no. 3, Sept. 1, 1919, pp. 128-129. Suggestions in regard to licensing, making inspection reports and maintaining logbooks.

CANADIAN AIR BOARD REPORT. Report of Canadian Air Board. Aviation, vol. 9, no. 8, Nov. 8, 1920, p. 264. Among matters considered are recent flight operations, Associate Air Research Committee; air navigation instructions for Commercial fliers, and application of air regulations to civilians.

APPRENTICES, TRAINING OF

NATIONAL APPRENTICESHIP COUNCIL. Apprenticeship Plan Drawn Up by Joint Conference Board. Contract Rec., vol. 35, no. 14, April 6, 1921, pp. 336-339. Formation of National Apprenticeship Council governing local councils is suggested. Apprenticeship agreement enforces employers to provide time for education along technical lines.

(m) "Customs airharbour" means an airharbour appointed by the Air Board with the concurrence of the



Per II a certificate i	ssued b	eans a person who is the hole y the Air Board certifying the ect and overhaul aircraft.	at he
Part V. Signal. Part VII. Signal. Part VIII. Traffic in the Namity of licensed serodromes and samplane station. Part IX. Dangeous dying. " X. Interviate flying. Part XI. General provisions. Schedules. FORMS. Memorandum respecting— Applications (ots— Registration of aircraft. Private air pilot's certificate (flying machines). Commercial pilot's certificate. Balloon pilot's certificate. Navigator's certificate. Navigator's certificate. Certificates of registration or competency ofs— Aircraft. Frivate air pilot. Commercial are pilot. Airchip pilot. Balloon pilot. Airchip pilot. Airchip pilot. Airchip pilot. Airchip pilot. Airchip pilot. Air engineer. Air engineer. 70623—1)	19 23 25 27 29 30 34 41 41 42 43 49 52 53 57 58 60 46 45 51 54 58 59 80 61	(c) "Passenger," in alation to an aircraft, means an aircraft engaged in the carriage of a passenger or or reward, or available for hire for the purpose of the carriage. New. (b) "Freight," in the carriage of a passenger or or reward, or available for hire for the purpose of such an aircraft flying without as well as within Canada, means an aircraft engaged in the carriage of goods for hire or reward, or available for hire for the purpose of such carriage, but, in relation to an aircraft when one or more persons are carried in addition to the pilot." New. (c) "Commercial" in relation to an aircraft means an aircraft used for the purpose of any profession, trade or business when one or more persons are carried in addition to the pilot, but does not include a passenger and a freight aircraft as above defined." New. (f) "Pilot" in relation to an aircraft includes the nerson in charge thereof." New. (g) "Air engineer" means a person who is the holder of a certificate issued by the Air Board certifying that he is competent to inspect and overhaul aircraft. New. (g) "Night" means between half a hour after sense, and half an hour before sunrise, except in flights beyond Canada when it means between sunset and sunrise. See I.C., Annex D. I. (a) "Visible" in relation to lights means visible on a dark night with a clear atmosphere. See I.C., Annex D. I. (b) The Interpretation Act (R.S.C. (1906), c. 1) shall apply to the interpretation of these regulations. New. "The effect of these problems to the result of tentage purposes if the place of these problems in the carriage of length or for tentage purposes if the place of these problems is the problems of the problems of the propose if the place.	

Canada's 1st Air Engineer License is Issued

PART IV.

PERSONNEL.

- 33. No person shall act as pilot of any aircraft or as navigator, engineer or inspector of any commercial aircraft, or of any aircraft primarily registered in Canada when flying outside Canada unless such person holds a certificate issued by the Air Board authorizing him to so act. See I.C., Art 12.
 - (2) This paragraph shall not apply,—
 - (a) to persons under instruction flying over water or, with the consent of the owner or owners, over an airharbour and such additional surrounding area as is approved by the Air Board, or
 - (b) to pilots, navigators and engineers of aircraft secondarily registered in Canada, who hold certificates authorizing them to act as such, issued by that one of His Majesty's dominions or by the foreign country in which the aircraft is primarily registered. See I.C., Art. 13.

- 10. It shall be a condition of the primary registration in Canada of any aircraft that, upon the Governor in Council declaring that a national emergency exists or is immediately apprehended, every such aircraft shall be subject to requisition in the name of His Majesty by the Air Board or any officer of the Canadian Air Force, and upon being so requisitioned shall become the property of His Majesty subject to its return or to the payment of compensation or to both as may be provided by law. New.
- (2) The registration in Canada of any aircraft primarily registered in any of His Majesty's Dominions other than Canada shall be subject to the like condition unless, under the law of that one of His Majesty's dominions in which the aircraft was primarily registered, it is subject to a paramount right to be requisitioned on His Majesty's behalf. New.
- Any certificate of registration of an aircraft may be suspended or cancelled at any time by the Air Board for cause. New.
- 12. No aircraft primarily registered in Canada shall fly beyond Canada unless it has been certified as airworthy by the Air Board, and no commercial aircraft shall fly within Canada unless it has been certified as airworthy by the Air Board, if it has been primarily registered in Canada, or, if it has been secondarily registered in Canada, then by the Air Board or by the proper authority in that one of His Majesty's dominions or foreign country in which it is primarily registered. See I.C., Art. 11.
- 13. Certificates of airworthiness may be issued by the Air Board, and may be limited to flying in specified areas, on specified routes, for specified periods, and upon compliance with specified conditions. *New*.
- 14. A fee of five dollars shall be payable for a certificate of airworthiness of an aircraft conforming to a type an example of which has been certified as airworthy in any of His Majesty's dominions or in any foreign country with which Canada has made a convention providing for the

PART IV.

PERSONNEL.

- 33. No person shall act as pilot of any aircraft or as navigator, engineer or inspector of any commercial aircraft, or of any aircraft primarily registered in Canada when flying outside Canada unless such person holds a certificate issued by the Air Board authorizing him to so act. See I.C., Art 12.
 - (2) This paragraph shall not apply,-
 - (a) to persons under instruction flying over water or, with the consent of the owner or owners, over an airharbour and such additional surrounding area as is approved by the Air Board, or
 - (b) to pilots, navigators and engineers of aircraft secondarily registered in Canada, who hold certificates authorizing them to act as such, issued by that one of His Majesty's dominions or by the foreign country in which the aircraft is primarily registered. See I.C., Art. 13.
- 34. Certificates to pilots, navigators and engineers may be issued by the Air Board and may be limited in

PERSONNEL

19

time and to flying only under specified conditions, for specified purposes, in specified types of aircraft, on specified routes or otherwise. New.

- 35. Certificates to inspectors may be issued by the Air Board and may be limited in time, to specified types of aircraft, or otherwise. New.
- 36. A fee not exceeding \$5 may be charged for any certificate issued under this Part IV. New.
- 37. No certificate shall be issued authorizing any person who is not a British subject to act as pilot, navigator, engineer or inspector of passenger, freight, commercial or state aircraft and it shall be a condition of every such certificate that the holder shall be a member of the Canadian Air Force and shall perform such military training or other duty as may be required. New.
- 38. A certificate issued to any pilot, navigator, engineer or inspector may be suspended, or cancelled at any time by the Air Board for cause, including the failure to comply beyond Canada with the provisions of Parts V., VI., VII., and VIII. of these regulations. New.

The Basis of the Canadian Air Engineer License - Notices to AE's and Owners

0/29/33

22/6/33

CERTIFICATES OF AIRWORTHINESS AIR ENGINEERS' RESPONSIBILITY AND AUTHORITY

Owing to the limited staff available, it is not possible for the Department to exercise close supervision over aircraft construction and repair. It is, therefore, only possible for the Department to endorse Certificates of Airworthiness when the owner of the aircraft produces satisfactory proof that construction and reconditioning have been carried out in an airworthy manner. The only acceptable means for an owner to prove that this has been done is to have the work certified by a licensed air engineer who is qualified and authorized by the terms of his licence to certify to the airworthiness of the aircraft in question.

T/8/37

29/12/37

AIRCRAFT EQUIPMENT—SERVICEABILITY

The responsibility of an Air Engineer licensed in (a) or (b) categories when certifying as to the fitness for flight of any aircraft, includes all equipment and instruments installed in such aircraft both as to their correct functioning and general serviceability.

1920 Air Engineer Application Form

60 AIR RE	GULATION	rs, 192	20	I have the following experien	ce with aircr	aft engines:	Torres (SA)	7		
A.B. 25.	2431474	e-Hulli	ing any land are in The			Number.			DATE.	
AIR REG	CANADA ULATIO		1920.	Туре.	Construct- ion.	Complete Overhaul.	Top Over- haul.	From	То	
APPLICATION FOR A										
Name of Applicant									<u> </u>	
Permanent Address				I have had the following es					ot above	
The Secretary, The Air Board, Ottawa, Ont. I am a British Subject and ask th I have the following general mech	at I be issued anical experies	a certific	ate as Air Engineer.	I attach at least three certificate	s of compete	ency from:				
	Тімі	ε.		Name.	of the sales	TATAL 2	Office or Fun	etion.		
Shop.	From	To.	Nature of Duties.							
				I hereby declare that the ab I am prepared upon notice to and submit to such tests and exam See I. Act C. 12, Annex E. V	ove particuls attend at the minations as Signat Date	urs are true in o	every respect the examining	ıg officer.		

1920 Air Engineer License - Air Board Form 26

FORMS AUTHORIZED	61
A.B. 26.	
CANADA	No
AIR REGULATIONS, 1920.	140
AIR ENGINEER'S CERTIFICATE.	File No
This certifies thatwhose address is	
and whose photograph is attached, is authorized by the Air Board to act	as an Air Engineer
to perform such military training or other duty as may be prescribed. The certificate is subject to cancellation at any time for cause. Dated this	19.
to perform such military training or other duty as may be prescribed. The certificate is subject to cancellation at any time for cause. Dated this	19. Soard.
to perform such military training or other duty as may be prescribed. The certificate is subject to cancellation at any time for cause. Dated this	19. Soard.

Canada's 1st Air Engineer License

A.B. 26-1-20-500. CANADA No. / AIR REGULATIONS, 1920 File No. 7.38./ AIR ENGINEER'S CERTIFICATE	AE AL BOARD
whose address is 2054 Athol St., and whose photograph is attached, is authorized by the Air Board to act as an Air Engineer. The holder of this certificate is a member of the Canadian Air Force and is liable to perform such military training or other duty as may be prescribed.	Signature B. In Somhie
Dated this 20th day of 1920 For the Air Board Supt. Certificate Branch	



for George V.





Canada aircraft: "British Registered"

The Ground Engineers' License - being a British legislative requirement for the inspection and certification of Airworthiness - were issued and controlled by the Air Ministry's A.I.D. in London, UK.



The Canadian Air Board and DND do not hold the legislative authority for the UK issued Ground Engineer's Licenses but are required to employ "Licensed Ground Engineers" to comply with the British Legislation for control of Airworthiness for every single "G" registered aircraft operated in Canada.

The Canadian Air Board / DND simply interviewed and administered the "tests" to acceptable candidates for Ground Engineer Licenses in Canada, collected the completed paperwork and issued them licenses as "Air (Board) Engineers in Canada.

The Air Ministry would have been notified of the license holders names and license numbers, and the Air Ministry had "representatives" in Canada.

Reports of the Minister and Deputy Minister 1920 - 1940: Revelations

Air Board Executives & DND influence and Control

With control of Canadian Civilian Aviation being placed - at the beginning - under the control of the Canadian Militia, the Annual Departmental report of the "Militia and Air Service" submitted by the Canadian Minister of Defense and Deputy Minister of Defense to the Governor General and to Parliament serve to identify that the Minister and Deputy Minister, Governor General and Parliament collectively recognised the need and the requirement for "Ground Engineers" in Canada as they were part of what was "required for control of Civil Aviation in Canada".

On **03 June 1921**, the editor of the US aviation magazine "**Aviation Weekly**" went on record at the end of an article written about the Canadian Air Board's "Air Engineer Notices" as saying

"The Canadian Air Board refers to the Aeronautical Ground Engineers as "Air engineers". It is pointed out that this might lead to some confusion in the future [...] an agreement on such and similar terms as far as they affect English speaking peoples would therefore appear highly desirable".

1920 Canadian Air Regulations

Why did the Air Board and Canadian Civil Service NOT create and publish any data related to the role, candidacy requirement and testing of "Air Engineers" in order to staff the Air Board and the Canadian Government's "Civil Air Service" including the Militia (later CAF and still later RCAF) squadrons?

From what can be determined from the documents currently available to the public, it is apparent that the Canadian Air Board either created the term "Air Engineer" internally or continued to use the RAF terminology from WW1 and failed to clearly define it as required within a Civil service and civilian government environment..

Why did the Air Board do this?

Possibly because the bulk of the Air Board Staff as well as the persons hired to staff the Government "Civil and Militia air Services" were returning RAF retirees (retirees rightfully being offered jobs before all others in government service post WW1) and as the majority were already "officers of the Crown" they 1) may not have "seen the need" to define or otherwise document what they already knew or 2) may have purposely used the RAF term instead of the Civilian terminology stated in legislation.

"Canada has not dealt with the law of aviation by legislation nearly as extensively as have most other jurisdictions"

- "The Law Relating to the Air" - presented by Col. 0. M. Biggar at the Annual Meeting of the Canadian Bar Association, 1921

British Requirement for Airworthiness - and Certification thereof

The British Air Navigation Act 1920" (10 & 11 Geo. V. C. 80), is statute law enacted by the British parliament pursuant to the Convention of Paris 1919.

- 1) Requires certificates of airworthiness for certain aircraft
- 2) Provides that no commercial aircraft shall fly on any day, unless it has previously been inspected and certified as to fitness by a Ground Engineer:
 - 1. on that day, or
 - 2. In the case of a flight commencing not later than 8 o'clock in the morning, at some time between:
 - 1. noon of the previous day, or
 - 2. the termination of the last flight made by the aircraft on the previous day whichever is the later, and the flight in question.

The Ground Engineers - being a British legislative requirement - were licensed and controlled by the Air Ministry in London, UK. The Canadian Air Board / DND simply collected the completed paperwork, interviewed and administered the "tests" to acceptable candidates for Ground Engineer Licenses in Canada and issued them licenses as "Air (Board) Engineers in Canada - but the Air Board and DND did not hold the legislative authority for the Ground Engineer's Licenses but were required to employ Ground Engineers to comply with the British Legislation for control of Airworthiness.

1920's - 1930's Canadian Requirements for Airworthiness

The Canadian Aeronautics Act 1919 is statute law enacted by the Canadian Parliament - also pursuant to the Convention of Paris 1919 - **and by 1936**:

Regulation 12 requires certificates of airworthiness for certain aircraft

Regulation 117 provides that no commercial aircraft shall fly on any day, unless it has previously been inspected and certified as to fitness by an Air Engineer:

- 1. on that day, or
- 2. In the case of a flight commencing not later than 8 o'clock in the morning, at some time between:
 - 1. noon of the previous day, or
 - 2. the termination of the last flight made by the aircraft on the previous day whichever is the later, and the flight in question.

Canada's delegated "Airworthiness Inspection Representatives" - Air Engineers - were issued licenses to accomplish certain types of "Inspection" and these were also listed in alphabetical order identical to the British Ground Engineer's Licenses:

- A. Aircraft (Airframe) Daily inspection before flight
- B. Aircraft (Airframe) Inspection subsequent to overhaul and repair before flight
- C. Engines Daily inspection before flight
- D. Engines Inspection subsequent to overhaul and repair before flight
- X. Electrical wiring and harnesses Daily inspection before flight

Canada - DND Reports on Civil Aviation

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	OTTAWA	

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Canada - DND Reports on Civil Aviation - 1926 - 1928 Statistics

DEPARTMENT OF NATIONAL DEFENCE

STATISTICAL SUMMARY OF CIVIL AVIATION IN CANADA 1928, INCLUDING ONTARIO PROVINCIAL AIR SERVICE AND LIGHT AEROPLANE CLUBS

Nature of Information	1926	1927	1928
Licensed Civil Air Personnel			
Pilots only (flying machines)	20	43	258
Pilot-Air Engineers. Pilot-Air Navigators. Pilot-Air Engineer-Air Navigators. Air Engineers only (flying machines)	18	29	70
Pilot-Air Navigators. Pilot-Air Engineer-Air Navigators			
Air Engineers only (flying machines)	65	74	130
Air Engineer-Air Navigators.			
Air Engineers only (flying machines) Air Engineer-Air Navigators Air Navigators only (flying machines) Airship Officer Pilots (1st Class) Balloon Pilots			
Balloon Pilots			
Total licensed personnel	103	148 59	85

14

DND: Report on Civil Aviation: gleanings

Air engineers are required to qualify for their licenses by taking "written or oral examinations" and "practical tests" on the construction, maintenance and operation of aircraft and aero engines.

They must produce credentials that they have given two years' satisfactory service in the construction or operation of aircraft.

A pilot may qualify as an air engineer, providing he has the practical and theoretical knowledge necessary to maintain his aircraft in proper airworthy condition.

88 Applicants were examined and granted Air Engineer's licenses. There were 200 Air Engineers licenses recorded in the DND records as of 1928

Air Mechanics were deemed by the DND as not worthy of "Licenses" in 1928 - however they were issued certificates of Competency by the RCAF upon completion of their "basic" training at Camp Borden.

Canada - Air Engineer license holders recognised

APPENDIX "G"

AIR ENGINEERS ENGAGED IN AVIATION, 1928

Name	Address	Employed by
Adams, A. G. W	482 Gertrude Ave., Winnipeg,	Canadian Transcontinental Airways, Ltd. Ontario Provincial Air Service.
Ambrose, F. J		International Airways of Canada, Ltd. Western Canada Airways, Ltd.

Canada - Air Engineer license holders 1928

APPENDIX "G"			MATCHINE OF MATCHAN			MEDORF ON KITAL AFT			MEPORT OF CIVIL AVE NESSE ENGAGED IN AVE		
AIR	ENGINEERS ENGAGED IN	AVIATION, 1928	and the same	THE RESERVE OF THE PERSON NAMED IN STREET		ATR STREET	NUMBER ROUGHUED IN AVEN	TON, IOI-CHERNE	ALL ENGI	NAMES OF STREET OF STREET	TANK THE CHEST
Name	Address	Employed by	Numb	,address.	Indically	Torus	Atlanta	Minployed by	Name	Address	Employed by
Cooper, T. F. Coomba, C. B. Coupland, R. W. Cressy, T. H. Crossley, C. C. Cressy, T. H. Crossley, C. A. D. Davis, P. I. Davis, C. J. Dobbin, E. C. Dobbin, E. C. W. Dobbin, C. R. Dodda, Robert. Duglass, J. R. C.	220 Manor Rd. E., Toronto, Ont. 75 Roselawn Ave., Toronto, Ont. 330 Dennison Rd., Victoria, B.C. The Pas, Man. 222 Moseberry St. Winnings, Moseberry St. Winnings, Moseberry St. Winnings, Moseberry St. Winnings, Moseberry St. F.O. Box 72, Dewdney, B.C. 1906 Irving St. N.E., Washington, D.C. U.S.A. 200 Lafontaine East, Montreal (Malsonneuve), P.Q. 1029 Main St. E., Hamilton, Ont. 1029 Main St. E., Hamilton, Ont. 110 Queen St. Ottawa, Ont. 111 Lauder Ave., Toronto, Ont.	Canadian Transcontinental Airways, Ltd. Ontario Provincial Air Service. International Airways of Canada, Ltd. Western Canada Airways, Ltd. Ontario Provincial Air Service. General Airways, Ltd. Moose Jaw Plying Club. International Airways of Canada, Ltd. Ontario Provincial Air Service. Canadian Airways, Ltd. Western Canada Airways, Ltd. Prospectors Airways, Ltd. Worthern Aerial Minerals Exploration, Ltd. Sowving Bros. International Airways of Canada, Ltd. Canadian Transcontinental Airways, Ltd. Sey View Lines, Ltd. Canadian Transcontinental Airways, Ltd. Canadian Transcontinental Airways, Ltd. Uncandian Transcontinental Airways, Ltd. Canadian Transcontinental Airways, Ltd. Canadian Transcontinental Airways, Ltd. Canadian Transcontinental Airways, Ltd. Western Canada Airways, Ltd. Canadian Transcontinental Airways, Ltd. Canadian Colonial Airways, Ltd. Western Canada Airways, Ltd. Canadian Colonial Airways, Ltd. Compagnie Aerienne Franco Canadienne. Dontario Provincial Air Service. Western Canada Airways, Ltd. Compagnie Aerienne Franco Canadienne. Dontario Provincial Air Service. Western Canada Airways, Ltd. Northern Aerial Minerals Exploration Ltd.	String, War. \$100, \$1, \$2, \$1, \$2, \$2, \$2, \$2, \$3, \$4, \$5, \$5, \$5, \$5, \$5, \$5, \$5, \$5, \$5, \$5	E Espaintific Denne, Supel Capt. The Superior of Sec. Cont. Den. Superior of Sec. Cont. Den. Superior of Sec. Cont. Superior of Sec. Sec. Sec. Sec. Superior of Sec. Sec. Sec. Superior of Sec. Sec. Superior of Sec	Present Grands Aleman. End. Deliberthesis internet of Grands, Just, Deliberthesis internet of Grands, Just, Deliberthesis internet. Deliberthesis inte	Person, G. J. Pe	1.1 Styles M. H. Philosophical Cont. 20 Circles S. Winning, Man. 20 Circles S. Winning, Man. 21 Vinces S. Milestoneye, Radiand, P. S. Milestoneye, Radiand, P. S. Milestoneye, 22 Jan. 23 Jan. 24 Vinces S. Milestoneye, 25 Jan. 26 Circles S. M. Milestoneye, 27 Circles S. Milestoneye, 28 C	Constitut Transmentionated Advancys, Lad. Derlawell And Endocries, East. Derlawell and Advancys, Lad. Derlawell and Advancys, Lad. Derlawell and Advancys, Lad. Derlawell and Transment Advancys. Derlawell and Transment Advancys. Derlawell and Transment Advancys. Derlawell and Derlay and Bracking Co., Derlawell Advancys, Lad. Derlawell and Derlawell Advancys. Derlawell Bernard Bernards Derlawell Derlawell Advancys. Derlawell Advancys. Derlawell Bernards Derlawell Derlawell Dereased Dereased De	Dayne, J. Thishash, B. Thompson, E. C. Thompson, Gos. A. Thompson, W. G. Tomilson, N. J. Thompson, V. G. Tomilson, R. G. Trendiaco, R. G. Tomilson, R. C. Asth. Heward Tomilson, W. Wannel, C. A. Thesele, Phil Thighty, R. G.	128. Sell Ave., W., Vancouver, D.C., 11, No. Sel, Lincolino, P.C., 20, Book P.C., Banalison, Ove., 20 William St. W., Chetham, Out. 212 Caller St-4., Windows, Out. 212 Caller St-4., Windows, Out. 213 Select Ave., Reservoire, Out. 214 Select Ave., Terrows, Out. 215 Parishwa Ave., Terrows, Out. 215 Parishwa Ave., Description, State, U.S.A., 215 Seventies Ave., Description, State, U.S.A., 216 Reservice, Out. 216 Reservice, Out. 217 Seventies Ave., Description, State, U.S.A., 218 Seventies Ave., Description, State, U.S.A., 219 Seventies Ave., Wassing Mail Seventies Ave., Wassing Mail	Outario Provincial Air Borrion. Wastern Canada Arrways, Ltd. R.C.A.P., No. I Denvel. International Airways of Canada, East, Outario Penvissial Air Service. Canadas Transpostimental Airways, Ltd. Wastern Canada Airways, Ltd. Sky View Lines, Ltd. Outario Provincial Air Service. Canadian Airways, Ltd.
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In the 1928 Report on Civil Aviation published by the DND there were 4 pages of Licensees.

The DND reports were freely available to purchase, many were shipped "With Gratitude" to foreign Governments - including the USA.

Education of Canada's "Aeronautical Engineers": U of T

UNIVERSITY OF TORONTO

THE PROVINCIAL UNIVERSITY OF ONTARIO



Course

in

Aeronautical Engineering

DEPARTMENT OF MECHANICAL ENGINEERING FACULTY OF APPLIED SCIENCE AND ENGINEERING 1929

Copies of this bulletin may be obtained, free, on application to the Department of University Extension, University of Toronto, Toronto 3.

This pamphlet is intended to furnish information concerning the undergraduate course in Aeronautical Engineering recently established by the University of Toronto.

Information concerning the requirements for admission, tuition fees, and other general information will be found in the Calendar of the Faculty of Applied Science and Engineering, a copy of which may be secured by addressing the Secretary of the Faculty.

FOREWORD

The dependence of national development and progress on transportation is nowhere more marked than in Canada. The settlement and development of the country has here followed, first, the natural waterways, then the railways, and now is following the airways. Regions formerly regarded as inaccessible and doomed to remain forever undeveloped are now not only being explored, but are actually in process of development almost entirely by means of aircraft. For the building up of effective national air transportation, trained aeronautical engineers are indispensable, and the training of aeronautical engineers is, therefore, a matter of national importance.

Education of Canada's Aeronautical Engineers : U of T

If we look at the transportation side of the question, we find that the great demand in Canada in the near future will be for highly trained pilots, pilot navigators, despatchers, meteorologists, radio operators, etc. It is unfortunate that more information about this field of work has not been available. It is not grasped here in Canada that a transport pilot, for instance, must be a highly trained man in order to work with the large

number of instruments now used. The mere flying of the plane is a very small part of the work. As I have heard it so aptly put by a well known flying man, "The pilot of an air liner compared with the pilot of an ordinary two or three seat plane is in very much the same category as the captain of an ocean liner compared with the captain of a ferry boat."

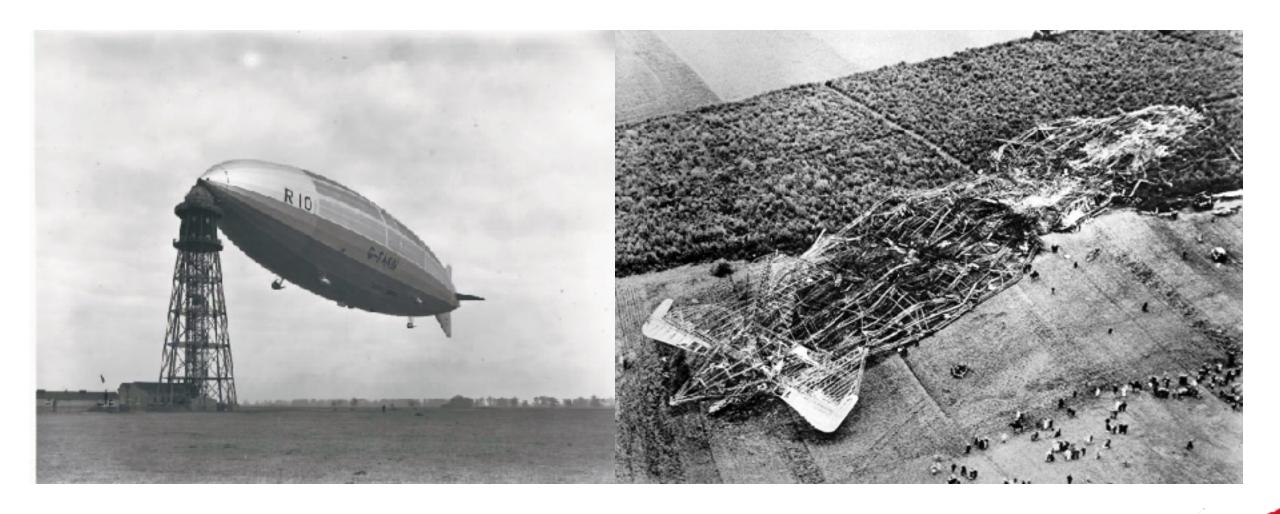
These transportation openings will call for men having at least two years' training above senior matriculation. On October 3rd, 1938, the University of Toronto commenced a two-year diploma course in Aerial Navigation which provides the required training. It is into this large operation field of endeavour that many young men will find their way.

I would state the whole case concisely by first advising all young men to obtain senior matriculation standing. This will give them a means of measuring their ability. If they do not wish to go farther with their school studies and they have a good technical school training, there are two good openings available; first, to go into the shop of an airplane factory and become a skilled airplane craftsman; and secondly, to work for a licence as a ground engineer. There will always be openings for these lastmentioned men who supervise and conduct the inspection of airplanes and engines on the ground. For those who wish to enter the transportation field, a two-year course of training should be taken after senior matriculation; and in speaking of this training I am thinking only of the timescheduled large transport work. There is an opportunity for commercial work in the unscheduled field of side-line operation which has been so successful in our mining areas. The training for this has been carried on up to date largely through the medium of the Flying Clubs which deserve a great deal of credit for operating with no real encouragement. Then,

Not only was there a 2 year "Diploma" course in "Aerial Navigation" taught for both prospective Pilots (RCAF) and to obtain a Ground Engineer's (A and C) license, but the very fact that the UofT uses the British terminology reveals the University knew more than they revealed.

University of Toronto - Department of University Extension, Aeronautic Training - Extension Course Sheets, Applied Science and Engineering, 1938 reprinted from the UofT Monthly, May 1938 by Prof. T.R.Loudon, Professor of applied mechanics, Faculty of Applied Science and Engineering, UofT

Airship Disaster



Canada - Control of Civil Aviation

The Aeronautics Act, 1927 (Revised Statures of Canada (R.S.C.) 1927, c. 3) moves control of Civil Aviation in Canada out from under the direct control of the Minister of Defense and into a "Department of Transport" under the Deputy Minister of Defense.

An independent "Technical Service" is also created and placed under the Deputy Minister of Defense to serve BOTH the Service and Civil aviation departments.

The Air Engineers report to the Chief Inspector of this new branch while the Air Mechanics are trained and certified competent as RCAF "Trades-Persons"

"The Department of Transport Act 1936" (c. 34, s. 5) transfers the control and supervision of the civil aviation branch of the Department of National Defense to the Canadian Minister of Transport and is published in The Canada Gazette on 3 October 1936. The "Department of Transport" performs a complete revision of all regulations with substantial additions.

This revision is accomplished just prior to WW2

ALL of Canada's Civil Aviation personnel (Pilots, Air Engineers and Air Mechanics) are "reserves for the RCAF".

Department of Defense reports - Airworthiness Inspection 1928

An Order in Council dated 16 August 1928 amends the Air Regulations:

If the Minister of National Defence has reason to believe [...] that a private aircraft within Canada is intended or is about to proceed on any flight while in a condition unfit for flight, he may give such directions and take such steps by way of provisional detention of the aircraft or otherwise in relation thereto as may be necessary for the purpose of causing the aircraft to be inspected by authorized representatives of the Minister of National Defence, and may, as the result of such inspection, cause the aircraft to be detained until he is satisfied that such alterations or repairs as he may consider necessary to render the aircraft fit for flight have been made.

"No aircraft which has been so deemed shall be authorised to fly <u>unless its airworthiness is attested to by the Minister of National Defence</u> or his authorized representatives."

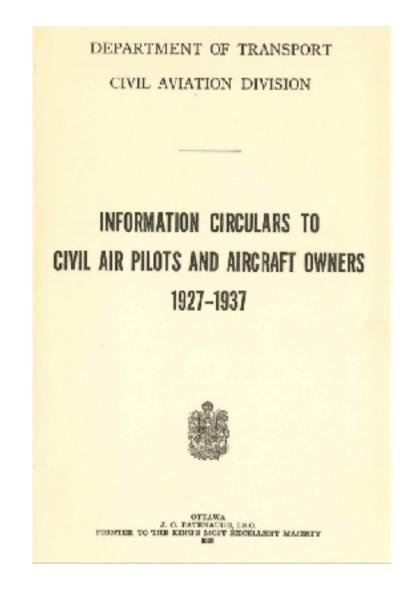
All aircraft are inspected at least once a year and after every major overhaul, by an inspector of this division.

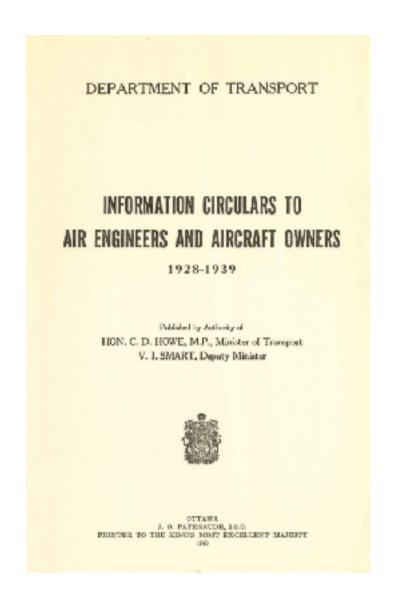
Every commercial aircraft must [...] be inspected daily by a licensed air engineer to ensure that it is maintained in an airworthy condition.

When technical advice is required, the Chief Aeronautical Engineer is consulted.

Commercial pilots are required to pass written examinations on the functions, construction and maintenance of aircraft, their engines and accessories" - but not undergo "Practical testing"

1938 / 1939 - Information Published by the "Dept. of Transport"





1938 - Information Circulars to Civil Air Pilots and Aircraft Owners

0/42/33 30/10/33

CERTIFICATES AND LICENCES

Part IV, paragraph 1, Air Regulations, states:-

"(1) No person shall act-

(i) as pilot of any aircraft, or

(ii) as engineer or inspector of any commercial aircraft, or

(iii) as pilot, engineer or inspector of any aircraft registered in Canada when flying outside Canada, or

(iv) as airport traffic control officer unless such person holds a certificate issued by the Minister authorizing him so to act."

61

0/42/37 20/10/37

REQUESTS FOR AIR ENGINEER'S AUTHORITY

Air Engineers holding (b) and (d) certificates will normally be required in future to pass examinations before additional types of aircraft

or engines are endorsed on their licences.

Temporary (b) and (d) authority will not normally be granted, except under special circumstances, and Air Engineers who require same to sign out aircraft or engines after structural repair must apply far enough in advance to the District Inspector to enable him to forward their requests to Headquarters with his recommendations.

0/53/37 9/12/37

MIXTURE CONTROL, AERO ENGINES

British Air Ministry Air Publication 1208, Airworthiness Handbook for Civil Aircraft, states:-

"The altitude and/or economizer control must be interconnected with the throttle so that the mixture will automatically be brought to the normal rich position as the throttle is closed. This requirement may be waived in individual cases."

In future, on aircraft for domestic use within Canada, this requirement will be waived.

M/7/35 17/7/35

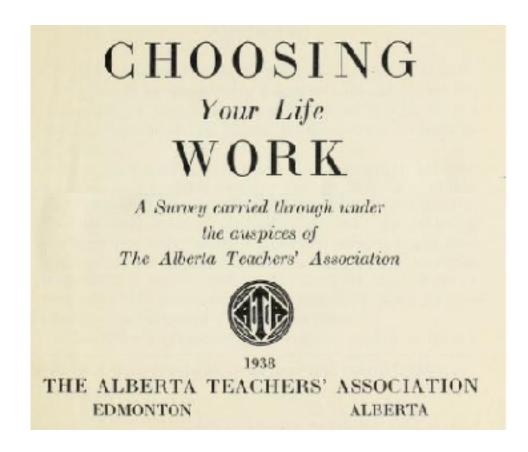
COMPASS SWINGING COMMERCIAL PILOTS

An aircraft may be considered airworthy as a whole only when each component, accessory gear, instrument, etc., is in satisfactory condition and fit for service. A compass is an important instrument and where the Certificate of Airworthiness requires its installation, the aircraft is not considered airworthy unless the compass is functioning correctly at all times.

Commencing September 1, 1935, Commercial Pilot and "A" and "B" Air Engineer candidates will be required to demonstrate to the satisfaction of the Examining Officer the correct procedure for the practical swinging of a compass in an aircraft, and a Certificate will not be issued until such an examination has been completed. The procedure to be adopted will be as described in the "Manual of Air Pilotage," Air Ministry Publication No. 1234.

The equipment is to be made available by the candidate.

1938 - Alberta Teacher's Association - Mostly correct



Under the term aeronautics may be included the occupations of pilot and the air engineer in civil aviation. Besides this branch there are also the spheres of military aviation and aeronautical engineering. Aeronautics also requires the services of many other workmen. (See Auxiliary Activities, Pape 217).

The pilot is concerned with the actual flying of aircraft from place to place; the air engineer maintains the aircraft in airworthy condition, repairing, overhauling and certifying machines as airworthy before and after flight, and after repair and overhaul. The field of military aviation also requires its flying and ground personnel.

A study of certain selected Alberta occupations by Tyler, Frederick Thomas for his Graduate Thesis from the University of Alberta drives the publication of this document.

1938 - Alberta Teacher's Association - Mostly correct

The Air Engineer

The air engineer must have much the same set of qualities as is demanded of the pilot, except that small physical or nervous defects do not constitute such serious handicaps. He must be self-reliant and very methodical in his habits. Initiative, and ability to pay attention to small details are very important. A natural mechanical ability, combined with mechanical training, is necessary. Most apprentices begin to train between the ages of 16

and 20 years. First class recommendations as to character and mechanical ability, from a qualified air engineer, or some person with recognized aeronautical qualifications must be presented by an individual who desires to become an air engineer.

Training. Students are recommended to take 2 years' work in a technical high school and then 2, or better 3, years at a technical institute which provides an approved course in aeronautical engineering. This would be followed by 12 to 18 months under an air engineer at an air port or in an aircraft factory. After this training they should be able to qualify as air engineers, and have the necessary background of technical training to enable them to eventually advance to the higher positions in the occupation. After the necessary training a candidate may write his examinations, and take the practical tests. If he is successful with respect to both the aircraft and the engine, he is given the A and C class certificates respectively. These qualify him to work on aircraft and engines and to inspect them for airworthiness before and after flight. After a further indefinite but usually lengthy period, during which he must be employed as an air engineer, he may be allowed to write for the B and D certificates, but only if the civil authorities are satisfied that he has sufficient experience to carry the added responsibilities. If successful he is qualified to certify aircraft and engines as airworthy after repair and overhaul.

Aeronautical (Ground) Engineers' Licenses

The holder of the licence may be the person who does any work that may be required to render the aircraft or engines fit for certification but if so, they are acting in a dual capacity. By "Dual Capacity" it means they are acting as BOTH:

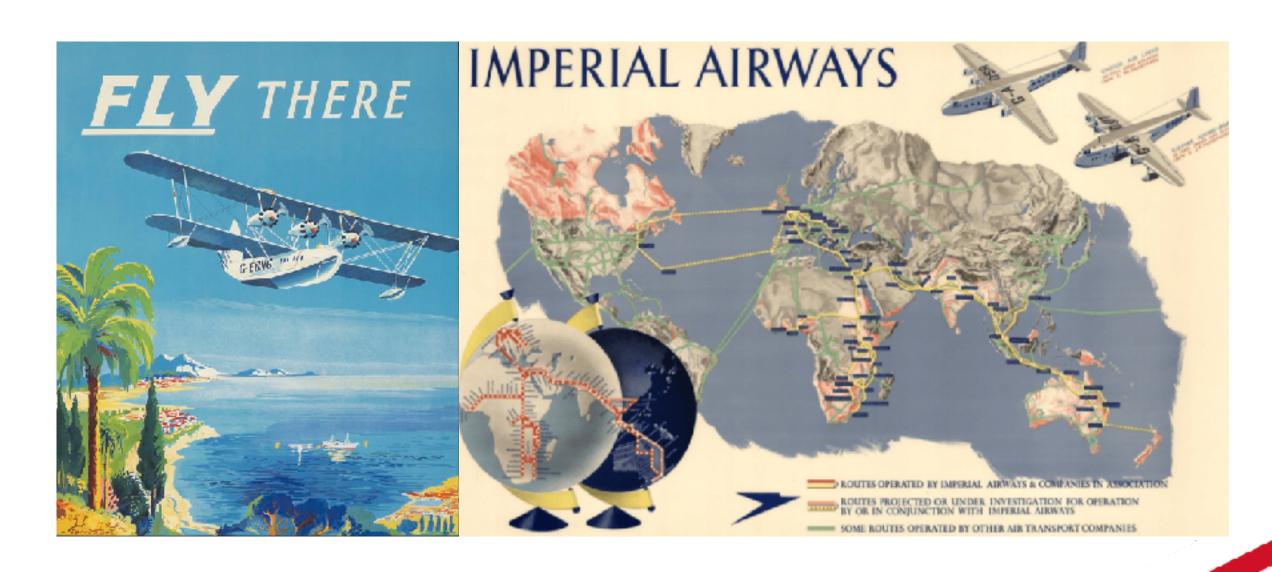
- 1. work-performing trades-person, and
- 2. inspector / certifier of the trades-persons' work and this sometimes makes the position of the license holder difficult.

The Licensed Ground Engineer may be employed to do the work required to render the aircraft or engines fit for certification because they also happen to be competent to perform the trades-work - thus reducing the financial burden on their employer for having to hire 2 people to accomplish the job - but after the work is finished, if the licensed Aeronautical Ground Engineer inspects and certifies the trades-work they have performed - or they inspect and certify the trades-work performed by others it is at that point where the licence holder is acting under the authority which is given to them by the Secretary of State for Air.

Licences were issued to Ground Engineers in the following categories:-

- A. Certification of Safety for Flight (airframes only) and of certain permitted minor repairs, modifications and replacements to airframes.
- B. Certification of airframes after overhaul and of major repairs or modifications.
 - ("A" and "B" licences may be issued to cover all types of airframe, or may be restricted to specified types, It may also be restricted to the airframes of land or marine aircraft.)
- C. Certification of aircraft engines before flight and of minor repairs, modifications and replacements.
- D. Certification of aircraft engines after overhaul and of major repairs or modifications.
 - ("C" and "D" licences may be issued to cover all aircraft engines or may be restricted to specified types. They may also be restricted to cover air-cooled or liquid-cooled engines.)
- "X" -Certification of the overhaul, repair or modification of various items of equipment.

An applicant for a licence was required to show that they had a good knowledge of their duties and the license requirements applicable to the license category desired.



From Ground Engineer to "A(M)E"

In early 1945 it was put forth - and agreed to - by the British Parliament that the **term "Ground Engineer"**, **as applied to an "Inspector of aircraft" was "misleading"**.

The British Government noted that "The title, although an acronym in lower case, was not clearly defined / specified within the Aeronautics Act and gave no indication of the serious work on which the licence holder might be engaged"

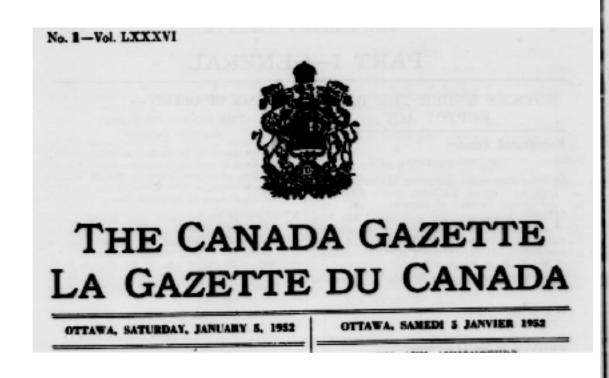
It was recommended that licence holders should in future be known as "Licensed Aircraft Engineers" (L.A.E's) and that the word "Maintenance" (M) be inserted within the designation "Licensed Aircraft Engineer" (L.A.E) to distinguish it a unique licence issued to L.A.E's and completely separate from the license held by an "Aircraft Operational Engineer", better known as a Flight Engineer. "

This recommendation was accepted by the British Government, and in March, 1946, the terms "Licensed Aircraft Maintenance Engineer" and "Licensed AME" were introduced into British Law.

The Government of Canada, recognising and following the changes being made to the license issued to British Airworthiness Inspection Representatives adopted the British terminology and changed the term for Canada's from "Air Engineer" to Aircraft Maintenance Engineer.

The change in terminology away from what was a completely "accurate term" for Canada's "Airworthiness Inspection Representative - Air Engineer" is reflected within the Canada Gazette and other Canadian Government publications of the day with the introduction of the AME(M) in Canada.

Canada Gazette Notices - Air Engineers > AMEs : 1952

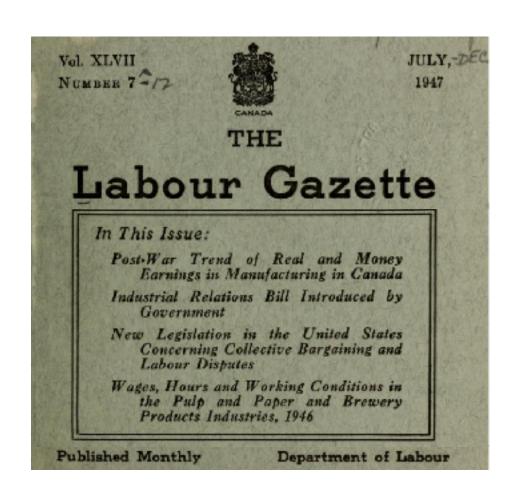


Aircraft Mechanic, Grade 1, Department of Transport, Edmonton, Alta. \$214-\$242 per month. Open to qualified male residents of the Edmonton Air Services District (which consists of the Province of Alberta, the Northwest Territories west of the 110th meridian, Yukon Territory and that part of British Columbia north and east of a line ten miles west

of the Alaska Highway).

†Qualifications: High school education; at least five years of experience in the maintenance and repair of aircraft and aircraft engines; personal suitability and satisfactory physical condition conforming to the requirements for a Private Pilot's Licence; possession of an Air Engineer's Certificate endorsed in categories or new Aircraft Maintenance Engineer's "M" licence under Category "A" least one of the following aircraft; Douglas DC-3; Lockhead 18-08, 10-A or 12-A; Beechcraft C-18-8 or D-17-8; Avro Anson V; DeHaviland DHC-2.

1947 - Canada Labour Gazette: Petition by the Air Engineers Society of Canada to change WARTIME Labour Regulations.



Applications for Certification Received during the Month of September, 1947

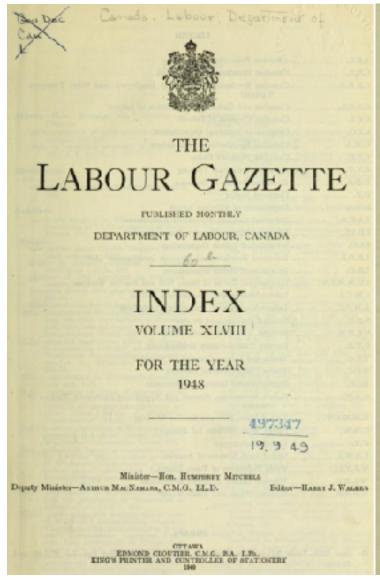
(5) Air Engineers Society of Canada on behalf of air engineers below the rank of assistant chief mechanic and assistant chief inspector employed by Canada Air Lines, Winnipeg, Man.

Application for Certification Rejected

Air Engineers Society of Canada and Trans-Canada Air Lines, Winnipeg, Man. (L.G., October, 1947, p. 1450).

Following an investigation of the application and a public hearing, the Board decided to reject the application. Reasons for Judgment will be issued at a later date.

1948 - Labour Gazette: Judgement rendered



REASONS FOR JUDGMENT in dispute between

The Air Engineers' Society of Canada, Applicant, and

Trans-Canada Air Lines, Respondent, and

Air Line Lodge 714 and Trans-Oceanic Lodge 1751, International Association of Machinists, *Interveners*.

This is an application for certification of bargaining representatives for a bargaining unit consisting of all licensed air engineers below the rank of assistant chief mechanic and assistant chief inspector employed by the respondent company.

At the present time, this group is part of a bargaining unit which includes all mechanic classifications in the maintenance and overhaul departments of the company, as well as other classifications in the stores and cargo service and commissary departments of the company, and which is covered by a collective agreement entered into between the respondent company and the interveners representing employees in such classifications.

The applicant claims that air engineers licensed by the Department of Transport constitute a separate craft and as such are entitled to recognition as a separate and appropriate craft unit for collective bargaining purposes. The applicant further

The Board consisted of the Vice-Chairman and Messrs. Deschamps, Hills, Mosher, Picard and Taylor.

The Judgment of the Board was delivered by the Vice-Chairman.

claims that the interests of the group are not adequately represented by the intervener unions as the membership of such unions is predominantly shop personnel.

The respondent company opposes the application on the ground that licensed air engineers are not a separate craft but are part of the mechanic craft group employed in its maintenance and overhaul departments.

The interveners oppose the application on the same ground and deny that the interests of the air engineer group are inadequately represented by them as alleged by the applicant.

1948 - Labour Gazette: Judgement rendered: Reason for decision

There are no basic technical or professional educational qualifications required for a licensed air engineer. The air engineer works up through the ranks of the mechanic classifications in the company's establishment, namely, learner, mechanic, and senior mechanic, to air engineer classification. In order to obtain a licence from the Department of Transport, an air engineer must go through a training period of several years on air engines, the length of training time depending upon the type of air engine and aircraft and the company requirements. In the case of Trans-Canada Air Lines, the Board is advised that an air engineer cannot sit for a Department of Transport examination for an air engineer's licence for the type of aircraft flown by the company until he has had a five-year training period and has been approved by the company to sit for such examination.

A chief mechanic and assistant chief mechanic who are also licensed air engineers have supervisory authority over crew shift chiefs and their crews. Aircraft inspectors are employed who are also licensed air engineers and rank equally with aircrew chiefs.

There are a number of employees holding air engineer licences working for the company as senior mechanics or mechanics, either because there are no existing vacancies in the company establishment for air engineers or by reason of not having passed the company's own tests and standards for air engineer classification.

The applicant claims that all air engineers holding licences from the Department of Transport should be in the proposed craft unit, even though not employed by the company as air engineers.

1948 - Labour Gazette: Judgement rendered: Final Verdict

Even if employees employed as air engineers were considered an appropriate craft group, it would be inappropriate to include therein persons holding air engineer licences who are working as senior mechanics or as mechanics. To include such persons in the bargaining unit would mean that part of the employees in the mechanics classification would be in one bargaining unit while other mechanics doing the same work and working side by side with them would be in another bargaining unit. Thus the occupational group would be split and an undesirable situation created from the point of view of orderly collective bargaining.

The Board does not consider that the responsibilities imposed upon air engineers for safety purposes in this instance affords adequate ground for their recognition as a separate craft group. The right to such separate recognition must be determined rather by the nature of the work, skills exercised and training required in acquiring such skills, and the manner in which the work is performed.

Canada - Air Navigation Orders, 4th ed, 1968



AIR NAVIGATION ORDERS

FOURTH EDITION

DEPARTMENT OF TRANSPORT CIVIL AVIATION BRANCH SCR/63-148 Made on April 24, 1963

AIR NAVIGATION ORDER, SERIES IV, No. 6

PRIVILEGES ATTACHING TO AIRGRAFT MAINTENANCE ENGINEER LIGENCES

- This Order may be cited as the <u>Privileges Attaching to Air-</u> eraft Maintenance Engineer Licences Order.
- In this Order, "licensee" means the holder of an Aircraft Maintenance Engineer Licence issued under the Air Regulations.
- 3. A Received may exercise the privileges granted by this Order only after he has inspected the aircraft or aircraft part and complied with all applicable instructions set forth in the Engineering and Inspection Manual issued under the authority of the Assistant Deputy Minister, Air.
 - A licensee whose licence is endorsed under Category "A" may
 before flight, certify as airworthy or serviceable, any aircraft of a type emborsed on his licence under that Category;
 - (b) certify that any miner repair or any replacement made to any aircraft of a type endorsed on his Beence under that Category complies with the standards of airworthiness established by the Minister;
 - (c) recommend the renewal of the Certificate of Airworthiness or Flight Permit of any aircraft of a type endorsed on his licence under that Gategory; and
 - (d) certify as altworthy or serviceable any glider of a maximum permissible gress weight of 2,000 pounds or less.
- A licensee whose licence is endorsed under Category "B"
 - (a) after manafacture, repair, modification or overhaul certify as airworthy or serviceable any airframe or any part of an airframe of a type of aircraft endorsed on his licence under that Category;
 - (b) certify that any repair, replacement, medification or overhall made to any alframe or any part of an airframe of a type of aircraft endorsed on his licence under that Category complies with the standards of airworthiness established by the Minister;
 - (c) cortify as nizworthy or serviceable any glider of maximum permissible gross weight of 2,000 pounds or less; and
 - (d) certify that any repair, replacement, modification or overhaul made to any glider of a maximum permissible gross weight of 2,000 pounds or less complies with the standards of airworthiness established by the Minister.

By 1968, Canada has incorporated the "C" License into the "A" - but still uses the exact same License structure implemented in 1920

Series IV, No. 6 (cont.)

 A licensee whose licence is endorsed under Category "D" may

- (a) after manufacture, repair, modification or overhaul certify as airworthy or serviceable any engine or any part of an engine of a type endoused on his licence under that Gategory; and
- (b) certify that any repair, replacement, modification or overhaul made to any engine or any part of an engine of a type endorsed on his licence under that Category complies with the standards of airworthiness established by the Minister.
- A licensee whose licence is endorsed under Category "R" may
 before flight certify as airworthy any aircraft of a type endorsed on his licence under that Category;
- (b) certify that any minor repair or any replacement made to any alreads of a type endorsed on his licence under that Category complies with the standards of sirvorthiness established by the Minister; and
- (c) recommend the renewal of the Certificate of Airworthiness of any aircraft of a type enforced on his licence under that Category.

Contravention of ANO srs IV
No's 6 or 7 carries a \$1000
penalty for both the Private or
Corporate licensee

1968 - Air Navigation Orders : A transferable License vs. a Company endorsement

The following is repeated throughout the Air Navigation Order, 1968 published by the Government of Canada

The C of A [...] is not in force in respect of a [...] aeroplane of a maximum permissible gross weight [...] at the time of any flight unless the aeroplane has

- (a) been maintained in a serviceable condition in accordance with the instructions set forth in the engineering and Inspection Manual issued under the authority of the Assistant Deputy Minister, Air, for the servicing, maintenance, repair and overhaul of aeroplanes; and
- (b) been certified as serviceable in the Journey and Aircraft Log [...] by:
 - 1. a qualified aircraft maintenance engineer, or by
 - 2. "an authorized representative of a company which company has been approved" by the Assistant Deputy Minister, Air,

for the purpose of inspecting and certifying the airworthiness of aircraft.

The AME license candidate is to be trained and qualified to accomplish the specific task of *inspecting and certifying the* airworthiness of aircraft.

OR,

the person may be NOT an AME but instead be an employee of "a company approved to accomplish the inspecting and certifying the airworthiness of aircraft" - thus that employee must be trained to accomplish a very specific task identical in manner to that of the AME.

1968 - the year Civil Aviation oversight in Canada changed

The 1960 Royal Commission on Government Reorganisation (Glassco Commission) resulted in a major impact to how Civil Aviation was controlled in Canada.

"Following the most careful and thoughtful consideration, the government has decided that there is only one adequate solution. It is the integration of the Armed Forces of Canada under a single Chief of the Defence Staff. This will be the first step toward a single unified defence force for Canada" White Paper on Defence, March 1964

1 February 1968 the Royal Canadian Navy, Canadian Army, and Royal Canadian Air Force were merged to form the Canadian Armed Forces as Bill C-243 came into effect. Several senior officers in each of the services resign in protest and frustration.

For Civil Aviation it means that there will be a 2 year GAP before Civil Aviation can be placed under the current Transport Canada management. A whole new Management team must be brought in and for a great many RCAF officers it means they will not have a "Direct Line" into Civilian jobs with the Government upon retirement.

It also means that the RCAF takes with them the bulk of their amassed knowledge and records since their creation - including what they know about the training and licensing of Civil Aviation trades persons and Air Engineers / AMEs.



1968 - 1970: DND clears out in preparation for transfer to "Civilian" government



1985: John Charles Clifford, B.A., LL.B - Inspection, A Case Study

To become acquainted with actual field level problems, Mr. Clifford accompanied aviation safety inspectors from Transport Canada on surveillance missions in four of six regions in 1985. His report was submitted to the Canadian Bar Association on 26 August 1987 and published by the Law Reform Commission in 1988

- "Over the last two centuries, governments in countries such as Canada, Great Britain and France have used inspectors to help implement public policy."
- "In the U.K. and France, a few authors have attempted to make sense of the inspectorates and administrative police used by their respective governments. This has not yet been done in Canada.
- "an assumption (in Canada) about inspectors did not stand up after research. In particular, government supplements its own inspectorates with private parties".
- "Government employees and private parties inspect on behalf of government."
- "Private inspectors (Licensed AMEs) are in fact the middle persons between parties being checked on (Air-Operator / AMO and the Trades-persons employed by the Operator / AMO) and the government institution which is ultimately responsible for supervision of a particular activity (Minister of Transport Transport Canada)."
- "Much of government's inspection is actually done by private inspectors. This theme is explored [...] using the example class of "aircraft maintenance engineers" (AMEs): they are private sector actors whether employees of private firms or self employed parties".

Weldon Newton, Bob Lafleur and Mike Murphy from Aviation Regulation headquarters & Dave Ellison - TC Airworthiness Inspector

Dryden - 1989



At 12:09 on 10 March 1989 Air Ontario Flight GX-1363 started it's takeoff roll, barely attaining flying speed it crashed almost immediately. 24 of the 65 persons on board lost their lives.

"The captain, as the pilot-in-command, must bear responsibility"

"However, it is equally clear that the air transportation system failed him"

Who controls the "Air Transportation System" in Canada?

1992 Final Report: Commission of Inquiry into the Dryden accident:

Commission of Inquiry to the Air Ordanio Crash at Ordan, Ordanio

Commission d'enquête sur l'écrasement d'un avion d'Air Ontario è Dryden (Ontario)

Commissions
The Honourable Weigl P. Moshansky
Comme
E.R. York Vet. GC.
Associate Council
G.L. Weits

B.J. McBey

Comission L'honorable Vagil P. Moshansky Croselle piddoue F.R. von Veh. un Croselle piddoue G.L. Wells Aprildoueupe F.J. Mollley

TO HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL

MAY IT PLEASE YOUR EXCELLENCY

By Order in Council PC 1989-532 dated the 29th of March, 1989, I was appointed Commissioner to inquire into the contributing factors and causes of the crash of Air Ontario Plight 1983 Fokker F-28 at Bryden, Ontario, on Haron 10, 1989, and report thereon, including such recommendations as I may deen appropriate in the interests of aviation safety.

Having previously submitted two Interim Reports. I now beg to submit my Final Report consisting of four volumes in each official language.

Respectfully submitted.

Crowniesione

MCR 114

Transport Canada establish a policy to ensure that required support staff will be provided so that inspector staff will not be misdirected from their operational safety-oriented surveillance duties in order to perform tasks more appropriately conducted by support staff.

MCR 115

Transport Canada establish an air carrier inspector training policy to be put into force without further delay, and that the policy ensure the following:

- (a) A clear statement of the requisite competencies for each inspector position in the Airworthiness and Flight Standards directorates of Transport Canada
- (b) A statement of the training courses required to be completed successfully by inspectors before they are delegated authority and before their probationary periods end.
- (c) Successful completion of training to be required before air carrier inspectors are delegated their authority credentials.
- (d) Establishment of a recurrent training program for each discipline of inspection to ensure continued competence.

In the "Final Report"

Moshansky made 191
recommendations (MCR's)
to which the government
committed
"Serious and careful consideration"

Moshansky also noted that "The AIRs' need to be reinforced"

That training requirement was included in MCR 114 & 115 and subsequently given to "TC's Internal Inspectors".

The flawed mentality that "AMEs" are "Mechanics" by industry, Government and academia meant that the AMEs were excluded from receiving the training.

ICAO:

The Chicago Convention (ICAO) and its supporting nineteen Annexes establish several key obligations for the Contracting States.

Annex 19 — Safety Management, Appendix 1 identifies eight critical elements (CE) that assist States in meeting the obligations related to the oversight of various aviation entities and activities.

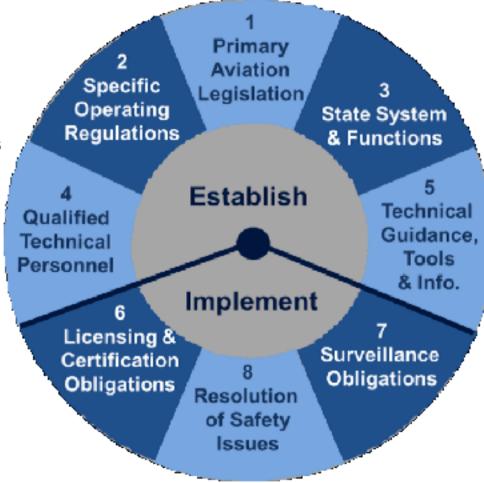
Annex 19 CE-4 "Qualified technical personnel" states the following:

The State shall

- establish minimum qualification requirements for the technical personnel performing safety oversight functions, and
- provide for appropriate initial and recurrent training to maintain and enhance their competence at the desired level.

"having a lack, or an insufficient number of qualified inspectors or aviation personnel holding highly - specialised technical expertise to perform job functions and tasks, affects the sustainability of safety oversight systems. This [...] remains one of the main obstacles to the implementation of an effective State safety oversight system"

Catalin Popa - Technical Specialist, Operational Safety Section - ICAO's Air Navigation Bureau



ICAO : ICAO Doc 9734 Pt A



Transport Canada: Divided Loyalty and AME training

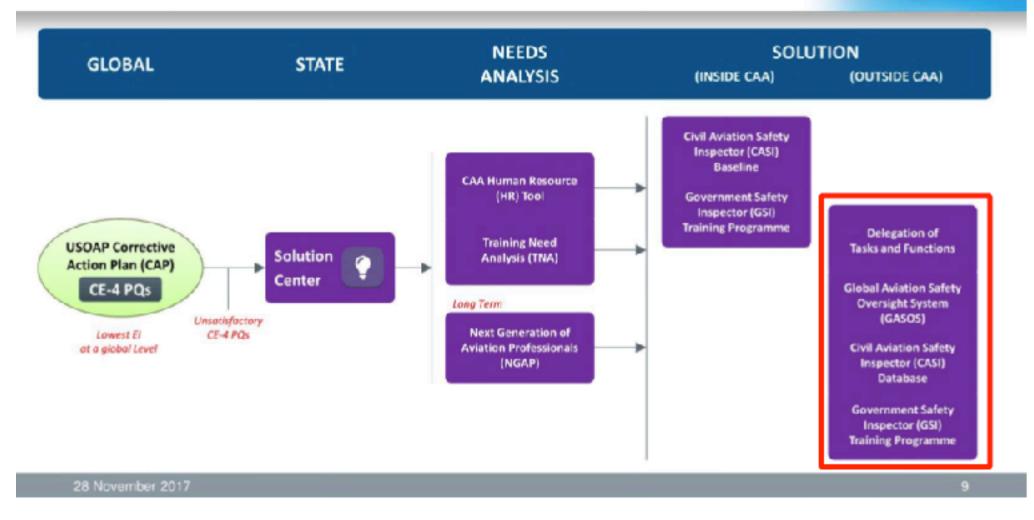
CARs mandates that the AMEs receive periodic and update training which is to be provided by their employer. The AMEs have 2 employers:

- the Minister on whose behalf they act as delegate Airworthiness Inspectors, and
- the private sector business that employs them due to not only an ability to perform maintenance but because they hold a license to subsequently inspect and release that maintenance work.



NO COUNTRY LEFT BEHIND





The newly recognised ICAO solution "Outside CAA" regarding "Delegation of Tasks and Functions" was originally implemented in 1919 with the creation of the AMEs

2 tier Licensing for Aviation Technical Staff

Certificates issued by the Canadian Air Board / DND - 1920 - 1939

- 1. Air Mechanic (AM): a person who is the holder of an <u>Aircraft Mechanic Certificate of Competency</u> issued by the Dept. of National Defence subsequent to their accomplishment of aviation trades training and competency testing by the CAF / RCAF authorizing them to perform aircraft maintenance as a Rigger, Fitter, Air Boat Builder, Fabric Worker
- 2. Air Engineer (AIR) a person who, as a pre-requisite is the holder of an Air Mechanic's certificate of competency, that has taken additional technical education in aircraft engineering design and standards and undertaken practical training specifically related to performing condition and conformance inspections and making attestations to the certification of aircraft maintenance trades-work and been tested and examined by the Air Board / DND, found capable and competent and issued an Air Engineer's License authorising them to accomplish Inspections for Condition and Conformance of aircraft and aircraft maintenance trade's work in support of Aircraft Airworthiness on behalf of the Air Board / Government of Canada in one or a mix of Categories A, B, C or D.

Certificates of Competency and Licenses that should still be issued today:

- 1. Aircraft Maintenance Technician (AMT) a person who is the holder of an **Aircraft Mechanics Certificate of Competency** issued by a Provincial Trades' certification Board as meeting the work-performance standards and certification requirements laid down by the Minister of Transport accredited by the Minister and authorizing the holder to perform aircraft maintenance but not inspections for condition/ conformance and attesting to airworthiness or return to service.
- 2. Aircraft Maintenance Engineer" (AME) a person who is the holder of an **Aircraft Maintenance Engineer's License** to Supervise Inspect and Certify issued by the Minister of Transport authorizing the holder to accomplish Inspections for Condition and Conformance of aircraft and aircraft maintenance trade's work in support of Canada's ongoing commitment to Aircraft Airworthiness both at home and internationally.

Transport Canada: Divided Loyalty and AME training

The current Transport Canada specified training for AMEs that states they are to graduate from the current training TCCA program as "Fully qualified trades-persons with the expectation that they will assume the Roles / Responsibilities of the AME License". There is a flaw however, because you cannot train a person to accomplish one job and then expect them to accomplish the duties and responsibilities of another the Role of the AME that they were not trained to accomplish.

The Canadian Government has repeatedly stated that "It does NOT train Trades-people" and that this is a "Provincial responsibility"

The Provinces rebut the Federal Government saying "Aviation and Aeronautics is YOUR area of oversight"

Transport Canada currently has a program that fails to properly allow for the accreditation of "Aviation Trades-persons" in a manner identical to other "Trades" in Canada - it also does not have a separate program that would train the AMEs to perform and meet the intended *Roles / Responsibilities of the AME*.

The holder of the licence may be the person who does any work that may be required to render the aircraft or engines fit for certification but if so, they are acting in a dual capacity. By "Dual Capacity" it means they are acting as BOTH:

- 1.work-performing trades-person, and
- 2.inspector / certifier of the trades-persons' work

To properly accomplish the "Work of the trades-person" (AMT) and that of the "Inspector / certifier of the trades-persons' work" (AME) there needs to be a 2 tier license structure - as was originally the case.

Identifying the "Divided Loyalty" and fixing the problem.

It therefore is of supreme importance that the AMEs legislative purpose as an Aviation Safety Inspector to

- 1) oversee maintenance and manufacturing activities leading to certification
- 2) inspect the work materials and the workmanship to ascertain and maintain acceptable levels of quality and safety against the design and operational standards, and
- 3) act as a Notary to the Government of Canada in respect of the Aeronautics Act and attest / certify / bear witness to the completeness of work, adherence to requirements and accuracy of the facts stated by the person(s) making entries in the records"

Be properly defined and documented not only within CARs but also within the Aeronautics Act which the CARs support.

Additionally, it must be firmly established that the Air Engineer (now AME) was not and is not an "Air Mechanic" as many would like to believe (and lead others to believe) but that the Air Mechanic was a separate and unique certificate of Competency issued to persons which the Canadian Air Board certified separately by way of the DND as a "trade's-person".

Research into AME History - Peer Group members







Tony Soulis



Peter Jenkins



Brian Whitehead

For the past 10 years these 4 retired Transport Canada Maintenance & Manufacturing executives - AMEs all - have been my sounding post

These gentlemen worked long and hard during their tenure with TC to ensure that the AME License was not done away with

Their support, critique and criticism has been welcomed and appreciated.

They provided not only support but also comment and guidance for which I am extremely grateful.

It is thanks to them that we are still licensed as "Engineers" today.

We studied hard, worked hard and earned the license.

Now it's up to us - Professional AMEs - to ensure that our licenses are not interfered with by those who do not hold an AME license or taken away, undermined or removed as a requirement for performing inspection / certification for release of aircraft after maintenance!